# Sites for Sustainable Development:

## Realizing the Potential of UNESCO Designated Sites to Advance Agenda 2030

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- The supplementary information for the main report is available here: https://unesco.org.uk/sites_for_sustainable_development_supplementary_information
- The executive summary (English) is available here: https://unesco.org.uk/sites_for_sustainable_development_executive_summary_English
- The executive summary (French) is available here: https://unesco.org.uk/sites_for_sustainable_development_executive_summary_French

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## List of abbreviations

| | |
|---|---|
| GGN | Global Geoparks Network |
| GIS | Geographic information system |
| ICCROM | International Centre for the Study of the Preservation and Restoration of Cultural Property |
| ICOMOS | International Council on Monuments and Sites |
| IPCA | Indigenous Protected and Conserved Areas |
| IUCN | International Union for the Conservation of Nature |
| IUGS | International Union of Geological Sciences |
| MAB | Man and the Biosphere |
| SDG | Sustainable Development Goals |
| UN | United Nations |
| WNBR | World Network of Biosphere Reserves |

Biodiversity at Mont Saint-Hilaire Biosphere Reserve, Canada / Louis-Philippe Trottier

# Foreword

Tackling the interconnected global challenges of our time – from the catastrophic impacts of drought, biodiversity loss, and flooding to the loss of traditional knowledge systems and gender inequality – requires everyone at the international, regional, and local levels to work together in new and unprecedented ways. In November 2021, UNESCO and its 193 Member States agreed on a ten-year strategy to address these challenges by mobilizing the organization's resources, partners, and networks to help deliver the 17 United Nations Agenda 2030 Sustainable Development Goals.

This timely report from the Canadian and UK Commissions for UNESCO explores the critical role of communities living in and around UNESCO's designated sites in promoting sustainable development at the local level. This global UNESCO network of World Heritage Sites, Global Geoparks, and Biosphere Reserves covers over 10 million $km^2$ and is home to over 300 million people.

The report shows that like everywhere around the world, these sites are at risk from global challenges. However, it also shows that they contain the ingredients to contribute to generating and sharing solutions to mitigating, adapting to, and tackling them. Moreover, as all sites have similar attributes, by working with multiple stakeholders, putting in place shared management plans, and sharing common UNESCO and UN values, they are uniquely placed to collaborate to share knowledge and solutions to these challenges.

I want to thank the Canadian and UK Commissions for this important report. At the country level, National Commissions are uniquely placed to be the principal agents for change to accelerate UNESCO's response to global challenges and maintain the relevance of its mandate and outreach. The National Commissions amplify UNESCO's vision and mission by engaging and mobilizing local actors. They also play an essential role in implementing the organization's programmes through rights-based and sustainable development approaches.

This report will help strengthen the interconnectedness of UNESCO's programmes and conventions. It provides a vision for how UNESCO designated sites, and most importantly, the communities, businesses, stakeholders, rights-holders, and organizations that work tirelessly to maintain and support their natural and cultural heritage for future generations, can work together to achieve the Agenda 2030 Sustainable Development Goals and beyond. Moreover, implementing the report's recommendations will foster international cooperation by building peace where it starts – in the minds of men and women around the globe.

**Shamila Nair-Bedouelle, Assistant Director-General Natural Sciences, United Nations Educational, Scientific and Cultural Organisation**

# Summary

People and communities worldwide will face unprecedented challenges in the coming decades. From gender inequality and extreme poverty to the catastrophic impacts of flooding and ecosystem collapse, everyone will be affected. At no other time have more partnerships, resources and activities been needed at the local, national and international levels to tackle these interconnected challenges.

This report outlines the role that UNESCO's global network of designated sites – World Heritage Sites, global geoparks and biosphere reserves[a] – can play in helping stakeholders (including businesses, communities, government agencies and their local organizations, Indigenous Peoples[b], traditional authorities, councils of elected representatives, and heritage and nature groups) carry out sustainable development approaches to tackle, mitigate and adapt to challenges like these.

The ideas contained in this report emerge from a study designed to explore the merits of UNESCO's increasing tendency to refer to biosphere reserves, global geoparks and World Heritage Sites as "sites for sustainable development."

**The study comprised:**

- a review of the positioning of the designated sites as sites for sustainable development in UNESCO strategies and programme documents and other grey literature
- original research with designated site managers to assess sites' capacities to function as sites for sustainable development

**Four questions guided the study:**

- What values and tools do the global network of sites share that site managers can use to help local communities and stakeholders tackle challenges to sustainable development?
- What inter-related threats and challenges do sites face?
- What common threats and challenges do different types of designated sites share?
- What financial, human and information challenges do site managers face in implementing a sites for sustainable development approach?

a As at December 31, 2021.

b In contrast to the current UN style guide, the words Indigenous and Indigenous Peoples are capitalized throughout this report in recognition of their use as identities, not adjectives (in the same way that English, French, and Canadian are capitalized).

**This report:**

- discusses the attributes of UNESCO designated sites that their managers can use to bring multiple stakeholders and rights holders together to address sustainable development challenges
- shows stakeholders and organizations working in UNESCO designated sites the value of working with sites to overcome challenges
- demonstrates the value (and in many cases, the untapped potential) of these sites to policymakers, governments and researchers looking at testing participatory approaches to sustainable development
- documents the need for new interdisciplinary toolkits, methodologies, guidance and research to stakeholders who are working across sites and landscapes

The report also emphasizes that the capacity of UNESCO designated sites to deliver sustainable development approaches is not reaching its full potential. One of the critical constraints on UNESCO designated sites is their lack of financial and human resources. Site managers also experience challenges in collecting and analyzing spatial data required for effective site management.

**Section 1** of this report describes how UNESCO designated sites apply a nexus approach to sustainable development – that is, how they consider the interactions between diverse goals and sectors and address interconnected challenges by finding synergies and trade-offs. This section also reviews how UNESCO has aligned its strategies, programmes and activities with Agenda 2030 and is increasingly positioning its World Heritage Sites, global geoparks and biosphere reserves as sites for sustainable development.

**Section 2** outlines the alignment between UNESCO designated sites and Agenda 2030. It explains that to work toward sustainable development, site managers and stakeholders must effectively balance economic, social, environmental and cultural concerns and act across local, national and international scales. UNESCO designated sites are at the nexus of the three core elements of sustainable development (economic development, social inclusion and environmental protection) and are at the crossroads where numerous actors, roles and functions connect local levels to global and vice versa.

**Section 3** sets out how UNESCO's characterization of its designated sites as sites for sustainable development is justified by the sites' mandates, strategies and structures. This section outlines five attributes that all UNESCO designated sites share that make them ideal places to enact sustainable development approaches. The sites' participatory approaches to site management place site managers in an ideal position to address the three core elements and actions (global, local and people) of sustainable development. The section shows that the values of UNESCO designated sites lie in how they are managed using participatory approaches that involve:

- identifying and engaging stakeholders and rights holders
- establishing common concerns
- developing iterative and adaptive management plans
- monitoring and reporting for both learning and compliance
- mobilizing knowledge among local, national and international networks

**Section 4** explores the shared inter-related threats that sites face and their capacities for sustainable development. It presents the results of original research involving a survey of UNESCO designated site managers in Canada and the UK, a novel analysis to identify similarities between sites, selected case studies from survey respondents, and a review of periodic reporting processes.

The survey found that sites face a range of sustainable development threats. The threats most frequently identified in the UK and Canada were financial resources, impacts of tourism, visitation and recreation, flooding, housing and storms. A cluster analysis showed that different types of designated sites from the two countries face similar threats. Further application of this methodology could help UNESCO designated site managers identify other sites facing similar threats so they could work together to share knowledge, pool resources and funding, and plan activities to work with their local stakeholders to address sustainable development challenges.

The data also revealed that site managers often lack the financial and human resources they need to work effectively with their stakeholders and communities to address these threats and ensure they fulfill their role in sustainable development.

**Section 5** proposes four recommendations for UNESCO and the national and sub-national authorities of its Member States to fully realize the potential of UNESCO designated sites as sites for sustainable development. In brief, the recommendations are to:

- Improve opportunities for knowledge exchange between UNESCO designated site managers and stakeholders in different countries by regularly monitoring the sustainable development challenges they face and making the results available in a searchable global database.

- Develop multi-designation thematic networks of UNESCO designated sites to allow site managers and stakeholders to collaborate.

- Provide training for UNESCO designated site managers on data collection, analysis, management and sharing with their stakeholders.

- Build the human and financial resource capacity of UNESCO designated site management teams.

UNESCO designated sites for sustainable development are at the cutting edge of Agenda 2030. Fully realizing their tremendous potential requires systems and infrastructure for knowledge exchange and training, the provision of human and financial resources, and data. UNESCO designated site managers need to be enabled and empowered as key actors for advancing sustainable development; policymakers at the local, national and international levels need to provide them with the appropriate support to carry out their roles.

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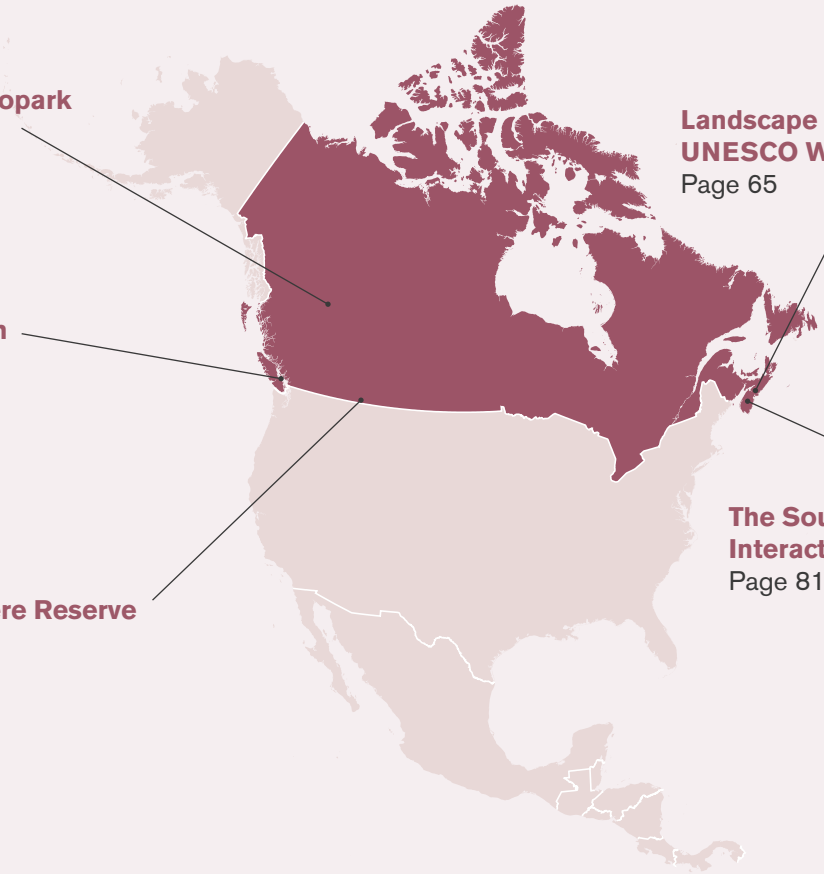

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# 1

# A nexus approach to sustainable development: The niche occupied by UNESCO designated sites

## Highlights

- In 2015, the United Nations 2030 Sustainable Development Agenda marked a paradigm shift in defining and coordinating international action to address the economic, social and environmental dimensions of sustainable development.

- UNESCO has aligned its strategies, programmes and activities with Agenda 2030.

- UNESCO is increasingly grouping and positioning its World Heritage Sites, global geoparks and biosphere reserves as sites for sustainable development.

A tree and other debris washes into the flooded moon ponds at Fountains Abbey and Studley Royal UNESCO World Heritage Site, UK / The National Trust

Winter view after a forest fire at Waterton Lake in the Waterton UNESCO Biosphere Reserve, Canada / Ramon Cliff

In September 2019, recognizing that action to meet the United Nations Agenda 2030 Sustainable Development Goals (SDGs) (See Box 1) was not advancing at the necessary speed or scale, the United Nations (UN) secretary-general asked all sectors of society to mobilize for a decade of action on three levels, calling for:

> …global action to secure greater leadership, more resources and smarter solutions for the Sustainable Development Goals; local action embedding the needed transitions in the policies, budgets, institutions and regulatory frameworks of governments, cities and local authorities; and people action, including by youth, civil society, the media, the private sector, unions, academia and other stakeholders, to generate an unstoppable movement pushing for the required transformations.[1]

In addition, the COVID-19 pandemic reversed years – possibly decades – of progress on fulfilling the SDGs. In 2020, hundreds of millions of people were pushed back into extreme poverty and chronic hunger.[2]

## Box 1: What is sustainable development?

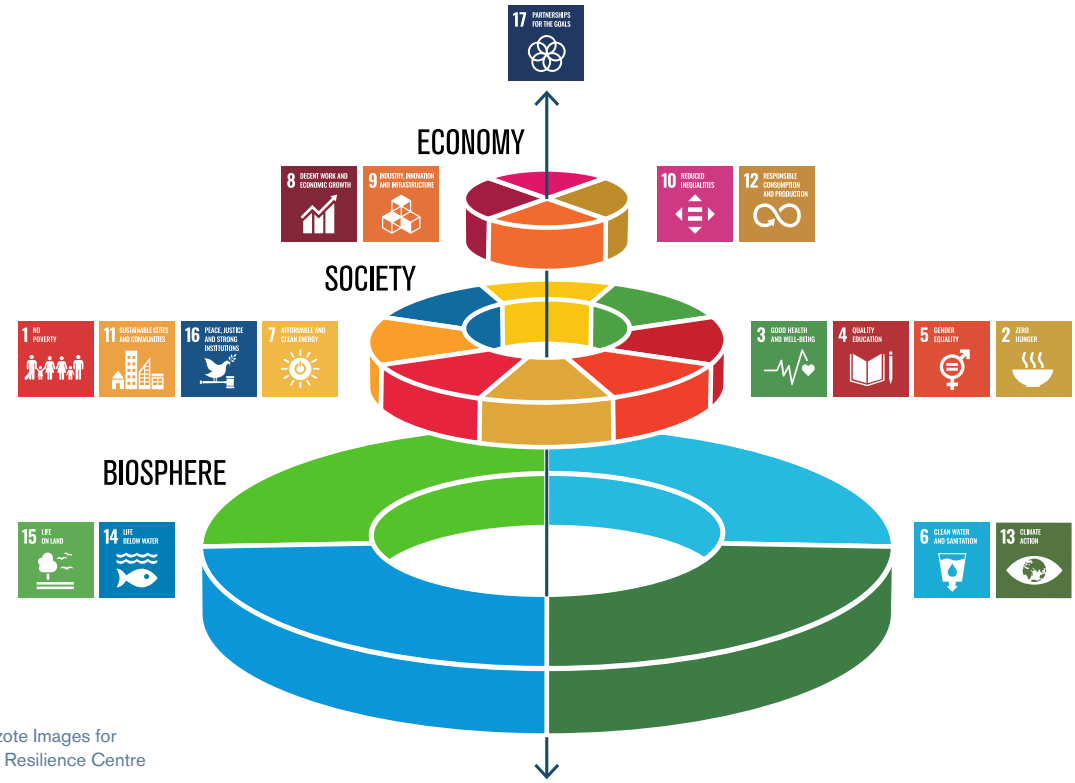
According to the UN,

**"Sustainable development has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development calls for concerted efforts towards building an inclusive, sustainable and resilient future for people and planet. For sustainable development to be achieved, it is crucial to harmonize three core elements: economic growth, social inclusion and environmental protection. These elements are interconnected, and all are crucial for the well-being of individuals and societies. Eradicating poverty in all its forms and dimensions is an indispensable requirement for sustainable development. To this end, there must be promotion of sustainable, inclusive and equitable economic growth, creating greater opportunities for all, reducing inequalities, raising basic standards of living, fostering equitable social development and inclusion, and promoting integrated and sustainable management of natural resources and ecosystems."**[3]

The Stockholm Resilience Centre expresses the relationship among the three dimensions of sustainable development and the SDGs by illustrating that economies and societies are embedded parts of the biosphere (see Figure 1).

In *Doughnut Economics*, author Kate Raworth's doughnut goes further by illustrating that sustainability is integral and comprehensive. The doughnut consists of two concentric rings: a social foundation to ensure no one falls short on life's essentials, and an ecological ceiling to ensure that humanity does not collectively overshoot the planetary boundaries that protect Earth's life-supporting systems. Between these two sets of boundaries lies a doughnut-shaped space that is both ecologically safe and socially just: a space in which humanity can thrive.[4]

## Figure 1. Economies and societies are embedded parts of the biosphere.




Source: Azote Images for Stockholm Resilience Centre

The impact of new and emerging pandemics is just one of the unprecedented and existential challenges that the global community faces in the 21st century. These challenges, including climate change and loss of biodiversity, are interconnected. For example, climate change has adversely affected food security and terrestrial ecosystems, contributed to desertification, and exacerbated land degradation in many regions.[5] These challenges transcend national boundaries and can only be addressed through concerted actions involving international, national, regional and local co-operation.

As a United Nations specialized agency, UNESCO was actively involved in developing Agenda 2030 and has a unique role to play in advancing the 17 SDGs and 169 indicators. Through its normative and standard-setting functions, programmes and policy advice – alongside competencies covering culture, natural sciences and education – UNESCO contributes to the achievement of all SDGs, with a particular emphasis on nine of them, whether through coordination work (as in SDG 4, Quality Education) or by contributing data to specific indicators (such as SDG 11.4, Protecting the world's cultural and natural heritage).[6]

The SDGs address global challenges and threats, but as the Agenda itself recognizes, the goals can only be achieved if all relevant stakeholders and rights holders, including Indigenous Peoples (see Box 2), work together to manage the interconnected threats and ensure synergies and trade-offs. Indeed, addressing the SDGs separately from each other can be problematic; sustainability researchers and policymakers recommend a nexus approach.[7] UNESCO has positioned itself as one of the leading UN agencies on nexus approaches, stating in its Programme and Budget (2022 to 2025) that "the Nature-Society-Development Nexus is the cornerstone of UNESCO's soft power."[8] UNESCO has also been recognized for its ability to bring together interdisciplinary expertise, with the 2017 to 2018 Multilateral Organization Performance Assessment recognizing that it "is unique for having the mandate and space to bring together experts, practitioners, citizens and governments to develop solutions to the global problems embedded in the SDGs."[9]

## Box 2: Agenda 2030 and Indigenous Peoples

The final resolution[10] for *Transforming Our World: the 2030 Agenda for Sustainable Development* refers to Indigenous Peoples six times. In particular, it states that:

**Our journey will involve Governments as well as parliaments, the United Nations system and other international institutions, local authorities, indigenous peoples, civil society, business and the private sector, the scientific and academic community – and all people.**

Colonization and discrimination over many years have resulted in the marginalization of Indigenous Peoples in many countries. Yet Indigenous Peoples and their knowledge systems have a vital role to play in advancing Agenda 2030. Indigenous Peoples make up less than 5 per cent of the global population but manage more than a quarter of the world's land surface. They contribute directly and positively to many of the issues that Agenda 2030 aims to address, including biological and cultural diversity, ecosystem health, food security and resilience and the impacts of climate change.[11]

Joyce Williams and Linda Williams (daughter and mother) at Át̓ka7tsem/ Howe Sound Biosphere Region (Canada) raising their hands to Mother Earth. The duo are wearing their traditional Skwxwú7mesh Úxwumixw/ Squamish Nation dresses / Kris Krug – David Suzuki Foundation

UNESCO's particularly interdisciplinary approach to the SDGs is reflected in its current Medium-Term Strategy (2022 to 2029)[12] and Programme and Budget (2022 to 2025)[13], both of which push for greater focus on multi-sectoral approaches at the global, regional and national levels. UNESCO's strategy is structured around four interlinked and cross-cutting strategic objectives designed to address global challenges and align with the SDGs.

UNESCO is also unique among international organizations because it recognizes four dimensions of sustainable development, adding culture to society, environment and economy.[14] UNESCO's understanding of culture derives from the 1982 Mexico Declaration that requires continuous review and revision of narratives, attitudes and values.[15] UNESCO's 2019 publication, *Culture|2030 Indicators: Thematic Indicators for Culture in the 2030 Agenda*,[16] acknowledges that while "the safeguarding and promotion of culture represents an end in itself, it also contributes transversally to many of the SDGs – including those on sustainable cities, decent work and economic growth, reduced inequalities, the environment, promoting gender equality, innovation and peaceful and inclusive societies." UNESCO also launched the Inter-Agency Platform on Culture for Sustainable Development in March 2021, which aims to strengthen collaboration and efforts to harness culture's contribution for sustainable development across the UN system.[17]

UNESCO contributes to Agenda 2030 by linking the protection of natural and cultural diversity to sustainable development through standard-setting instruments (conventions, recommendations, declarations) and by harnessing its international programmes and networks to scale partnerships from global to local and vice versa.

At the site level, UNESCO is positioning biosphere reserves, global geoparks and World Heritage Sites as sites for sustainable development (see Box 3), reasoning that they can address global challenges through a nexus approach: combining scientific and local knowledge and participatory and inclusive adaptive governance to reduce biodiversity loss, conserve geodiversity, improve livelihoods in local communities and enhance social, economic and cultural conditions.[18]

UNESCO's sites for sustainable development vision has developed over several years, beginning in 1996.[19] After Agenda 2030 was adopted in 2015, the UNESCO Secretariat began to present its global networks of UNESCO designated sites as places at the intersection of nature, society and development, with a specific emphasis on how they demonstrate balance between development and the sustainable management of natural resources.

Starting with its Programme and Budget in 2016 and continuing in the Programme and Budget for 2020–21[20] UNESCO and its Member States began to present a vision of UNESCO designated sites as "learning sites for inclusive and comprehensive approaches to environmental, economic and social aspects of sustainable development."[21]

Residents in Torbay in the English Riviera UNESCO Global Geopark (UK) celebrate Earth Hour 2022 with candle-lit beach artwork and musical entertainment / Kathy Coley Photography

## Box 3: UNESCO networks of designated sites and sustainable development

### Sustainable development and biosphere reserves

Biosphere reserves are areas of terrestrial, marine and coastal ecosystems that promote solutions meant to reconcile biodiversity conservation with sustainable use. They are "learning places for sustainable development"[22] – special places for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including preventing conflict and managing biodiversity.

These model regions strive to meet the objectives of UNESCO's Man and the Biosphere (MAB) Programme to:

- conserve biodiversity, restore and enhance ecosystem services, and foster the sustainable use of natural resources
- contribute to building sustainable, healthy and equitable societies, economies and thriving human settlements in harmony with the biosphere
- facilitate biodiversity and sustainability science, education for sustainable development and capacity-building
- support mitigation and adaptation to climate change and other aspects of global environmental change[23]

Their three main functions are: conservation of biodiversity and cultural diversity; economic development that is socio-culturally and environmentally sustainable; and logistic support, underpinning development through research, monitoring, education and training. In addition to the mandate of biosphere reserves, the Lima Action Plan (2016 to 2025)[24] for the MAB Programme and its World Network of Biosphere Reserves places a strong emphasis on achieving and implementing the 2030 Agenda for Sustainable Development.

UNESCO is a key institutional partner of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services,[25] which recognizes that nature is essential for achieving the SDGs.

### Sustainable development and geoparks

UNESCO global geoparks are single, unified geographical areas where sites and landscapes of international geological significance are managed using a holistic approach that favours protection, education and sustainable development. This approach, which combines conservation with sustainable development while involving local communities, is becoming increasingly popular among communities seeking international recognition for the geodiversity in their area.

These designated sites meet the objectives of the International Geoscience and Geopark Programme to:

- protect the geosites within the geopark territory
- encourage sustainable (geo)tourism
- enhance awareness and understanding among youth and visitors about the area's geological heritage and history
- promote earth sciences research

In addition to promoting geoheritage, geoparks actively conserve and promote tangible and intangible cultural heritage. As it does with biosphere reserves, UNESCO promotes geoparks as "laboratories for sustainable development." While there is no current action plan for UNESCO global geoparks, their actual and potential contributions to the SDGs are well documented.[26]

UNESCO implements its International Geoscience and Geoparks Programme through co-operative ventures with the International Union of Geological Sciences (IUGS) and the Global Geoparks Network (GGN), both of which have a seat on the UNESCO Global Geoparks Council.

Neither the IUGS nor the GGN statutes explicitly link to the SDGs. However, the aims of the IUGS – which include using geoscience "to sustain Earth's natural environment, to use all natural resources wisely, and to mitigate the impacts of geohazards for the benefit of society in the attainment of their economic, cultural and social goals"[27] – have clear

connections to Agenda 2030. Similarly, the GGN's objectives include ensuring "sustainable socio-economic and cultural development on the natural (or geological) system."[28] The International Union for the Conservation of Nature (IUCN) is also a member of the UNESCO Global Geoparks Council and recognizes that geodiversity and geoconservation "contribute to achieving the United Nations' 2030 Agenda."[29]

### Sustainable development and World Heritage Sites

A World Heritage Site is a landmark or area that benefits from international legal protection through the 1972 UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage[30] (commonly referred to as the World Heritage Convention). To be considered for designation, sites must be of Outstanding Universal Value[c] and meet at least one of 10 selection criteria.[31] In addition, the State Party to the Convention should demonstrate its full commitment to preserving the heritage concerned.[32] Examples of World Heritage Sites include ancient ruins or archaeological sites, historic structures, buildings, cultural landscapes, cultural routes, cities, natural features, important ecosystems, protected areas and monuments.

Although the World Heritage Convention predates the Brundtland Commission[33] and its definition of sustainable development, the convention's recognition of "the duty of ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage"[34] is very much aligned with sustainable development approaches. References to sustainable development have been subsequently reflected in the Convention's Operational Guidelines and other programme documents.

To ensure policy coherence with the UN sustainable development agenda, UNESCO adopted the Policy Document for the Integration of a Sustainable Development Perspective into the Processes of the World Heritage Convention in 2015. The policy aims to: "Assist States Parties, practitioners, institutions, communities and networks, through appropriate guidance, to harness the potential of World Heritage properties and heritage in general, to contribute to sustainable development and therefore increase the effectiveness and relevance of the Convention whilst respecting its primary purpose and mandate of protecting the Outstanding Universal Value of World Heritage properties."[35]

The operational guidelines for the World Heritage Convention expect state parties to mainstream the 2015 Sustainable Development Policy into their programmes and activities relating to the World Heritage Convention and sites. Paragraph 15 of the guidelines states that countries should "contribute to and comply with the sustainable development objectives, including gender equality, in the World Heritage processes and in their heritage conservation and management systems."[36]

Subsequently, in 2017, specific questions relating to sustainable development were embedded in the periodic reporting questionnaire that is part of the periodic reporting process undertaken by World Heritage properties every six years. The latest version (2021) of the operational guidelines states that "the protection and conservation of the natural and cultural heritage constitute a significant contribution to sustainable development."[37]

UNESCO works with three advisory bodies on the World Heritage Convention: the IUCN,[38] the International Council on Monuments and Sites (ICOMOS), and the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM). The IUCN champions nature's role in achieving the SDGs through a global network of experts organized under its commissions. ICOMOS[39] is a leading international voice in integrating cultural heritage within sustainable development and implements this integration through the *ICOMOS Action Plan: Cultural Heritage and Localizing the SDGs*. Similarly, ICCROM[40] recognizes that cultural heritage conservation is fundamental for sustainable development.

The latest UNESCO Programme and Budget (2022–2025), adopted in November 2021, provides further strategic direction to its desire to take a multi-level, interconnected and holistic approach to its global programmes and UNESCO designated sites. At its heart is its work at the nexus of nature, society and development, as mentioned earlier:

**The Organization will further promote and strengthen the unique opportunities offered by UNESCO's designated sites (Biosphere Reserves, UNESCO Global Geoparks and natural World Heritage sites) to combine scientific and local knowledge and participatory governance with a view to reduce loss of biodiversity, conserve geodiversity, improve livelihoods of local communities and enhance social, economic and cultural conditions, including employment opportunities for youth (SDGs 8.9, 13.3, 15.1, 15.2 and 15.9).**[41]

The UNESCO Programme and Budget 2022 to 2023 also outlines specific sectors where UNESCO will use this approach. This includes using UNESCO designated sites as eco-hydrology demonstration sites that collect ecological and biological data as climate change observatories for gender-responsive scientific assessments – including local and Indigenous knowledge and biodiversity conservation and monitoring – for education for sustainable development approaches and youth engagement.

It should be noted that the sites for sustainable development approach is not exclusive to World Heritage Sites, global geoparks and biosphere reserves. UNESCO is also positioning its wider designations, including the Creative Cities Network and Learning Cities, to promote effective urban solutions to climate change, to harness technology and innovation, and to promote inclusive and participatory urban development, Indigenous knowledge and practice, and youth engagement.[42]

In summary, Agenda 2030 is integrated into programme and strategy documents for UNESCO designated sites, and UNESCO is increasingly grouping biosphere reserves, geoparks and World Heritage Sites together as sites for sustainable development in its organizational strategies and policies. The next section examines the justification for this grouping by analyzing how UNESCO designated sites contribute to Agenda 2030.

Local communities taking part in a Bioblitz at the Mount Arrowsmith Biosphere Region, Canada / Monica Shore

## Table 1. UNESCO strategic documents that group UNESCO designated sites together

| Strategy or policy | Mentions of designated sites |
|---|---|
| **UNESCO Strategy for Action on Climate Change 2018 to 2021**[43] | UNESCO designated sites – including the World Network of Biosphere Reserves (669 sites in 120 countries), the 1972 World Heritage Convention (147 properties listed for their biodiversity value), and the UNESCO global geoparks – provide a rich network of sites as platforms to promote innovative approaches to enhance biodiversity conservation while addressing climate change in an overall sustainable development context. (*Paragraph 29*)<br><br>The iconic value of UNESCO designated World Heritage properties, biosphere reserves and UNESCO global geoparks helps them to serve as useful platforms for the implementation of the strategy by sharing information about applied and tested monitoring, mitigation and adaptation processes. Moreover, they raise awareness of the impacts of climate change on human societies and cultural diversity, on biodiversity and ecosystem services, and on the world's natural and cultural heritage. Spread across different regions, climates and ecosystems worldwide, UNESCO designated sites serve as global field observatories for climate change, where information on the impacts can be gathered and shared. Studies are being conducted at several sites, and the results are being used to plan tailored adaptation and mitigation measures. Where additional funding can be raised, this work includes promoting sustainable applications of renewable energy technologies and energy efficiency and sharing related best practices in line with the various standard-setting instruments. (*Paragraph 76*) |
| **UNESCO's 2018 "commitment to biodiversity"**[44] | Areas for future action include:<br>• enhancing the use of UNESCO designated sites for innovative interdisciplinary monitoring of biodiversity conservation and local sustainable development strategies<br>• increasing the implementation of best practices, developing new technologies and strengthening data-sharing, open access (World Heritage Sites and biosphere reserves) and interoperability through data and metadata systems, such as the Ocean Biodiversity Information System and the Intergovernmental Oceanographic Commission's Ocean Data and Information System |
| **UNESCO's 2018 Policy on Engaging with Indigenous Peoples**[45] | UNESCO works to ensure dialogue and co-production of knowledge between Indigenous Peoples and scientists to identify, understand and address economic, environmental, ethical, cultural and societal challenges, including global environmental changes. It does this particularly through its Local and Indigenous Knowledge Systems, Intergovernmental Hydrological Programme, MAB Programme, and International Geoscience and Geoparks Programme. This guidance arose following the adoption of the UN Declaration on the Rights of Indigenous Peoples[46] in 2007. It now guides all of UNESCO's programme sectors in their interactions with Indigenous Peoples and organizations. |

# 2

# Aligning UNESCO designated sites with Agenda 2030

## Highlights

- To work toward sustainable development, stakeholders and rights holders must balance environmental, economic and social concerns effectively and act across multiple (local, national and international) scales.

- UNESCO designated sites serve at the nexus of the three core elements of sustainable development and are at the interface between numerous actors, roles and functions. They form a bridge from local to global and vice versa.

Hišinqʷiiɬ Regional Gathering, Clayoquot Sound Biosphere Region, Canada / Melody Charlie

Stockbridge Market in the Old and New Towns of Edinburgh UNESCO World Heritage Site, UK / Historic Environment Scotland

Individually and collectively, UNESCO designated sites are at the nexus of the core elements (economic development, social inclusion and environmental protection) and actions (global, local and people) of Agenda 2030. Their roles and contributions to these elements and actions are outlined below.

## 1. Economic development

One of the functions of biosphere reserves is to foster "[e]conomic development that is socio-culturally and environmentally sustainable." This mainly occurs in the reserves' transition areas – that is, areas where communities foster socio-culturally and ecologically sustainable economic and human activities. For example, strategic lines of action in the Lima Action Plan for UNESCO's Man and the Biosphere (MAB) Programme and its World Network of Biosphere Reserves (2016–2025) include supporting entrepreneurs, social enterprises, green economies and local brands.[47]

The operational guidelines for UNESCO global geoparks describe geoparks' use as "sustainable economic asset[s] such as through the development of responsible tourism." Therefore, application dossiers require information about promoting local and regional sustainable tourism, and revalidations require information on geotourism, agrotourism and local development.

The operational guidelines for World Heritage Sites[48] encourage the development of programmes that "promote sustainable and inclusive economic benefits for local communities and Indigenous Peoples and identify and promote opportunities for public and private investment in sustainable development projects." In addition, the *Policy on the Integration of a Sustainable Development Perspective into the Processes of the World Heritage Convention*[49] provides guidance on inclusive economic development and encourages sites and states to ensure growth, employment, income and livelihoods, promote economic investment and quality tourism,

and strengthen capacity-building, innovation and local entrepreneurship.

Research conducted by the UK National Commission for UNESCO in 2020 found that UNESCO designated sites in the UK generate about £151 million in financial benefit to local communities each year and contribute significantly to the UK economy.[50] However, designation managers' potential to use the UNESCO status to attract additional funding differs significantly between designation types and sites. The study also showed that UNESCO designations in the UK contribute considerably to several SDGs, including SDG 8 (Decent Work and Economic Growth), SDG 4 (Quality Education), and SDG 11 (Sustainable Cities and Communities).

## 2. Social inclusion

UNESCO requires biosphere reserves to "provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale."[51] The nomination form contains questions about who the primary users of the reserve are, women's and men's different levels of access to and control over resources, descriptions of local communities, cultural values, languages, benefits to local communities and social organizations, and the participation of women, Indigenous communities and youth in the reserve. In addition, the Lima Action Plan recommends actions for conserving socio-ecological systems and "places strong emphasis on thriving societies in harmony with the biosphere for the achievement of the Sustainable Development Goals and implementation of the 2030 Agenda for Sustainable Development."[52] The plan also emphasizes that "[e]ffective, equitable and participatory planning for sustainable development in biosphere reserves specifically takes into account the rights, needs and capacities of young people, as well as women and Indigenous and local communities, and their ownership, and access to and sustainable use of natural resources in and around biosphere reserves."

UNESCO guidelines for global geoparks require the areas to "promote awareness of key issues facing society in the context of the dynamic planet we all live on, including but not limited to increasing knowledge and understanding of geoprocesses; geohazards; climate change; the need for the sustainable use of Earth's natural resources; the evolution of life and the empowerment of Indigenous Peoples."[53]

Geopark management plans should also provide for the social needs of local populations and conserve cultural identities. Specifically, the guidelines state that "[l]ocal and Indigenous knowledge, practice and management systems should be included, alongside science, in the planning and management of the area." The nomination procedure involves questions relating to local and Indigenous knowledge, language, youth engagement and intangible cultural heritage.

World Heritage Sites require management plans that consider, where appropriate, "social and cultural practices, economic processes and other intangible dimensions of heritage such as perceptions and associations."[54] The *Policy for the Integration of a Sustainable Development Perspective into the Processes of the World Heritage Convention*[55] is clear that "all dimensions of sustainable development should apply to natural, cultural and mixed properties in their diversity." The policy contains recommendations for contributing to inclusion and equity; enhancing quality of life and well-being; respecting, protecting and promoting human rights; respecting, consulting and involving Indigenous Peoples[56] and local communities; and achieving gender equality. In addition, the Indigenous Peoples' Forum[57] on World Heritage promotes rights-based, equitable and sustainable development of World Heritage Sites by representing the voices of Indigenous Peoples with regards to the World Heritage Convention:

> The World Heritage Convention in Article 5 calls upon States Parties to "adopt a general policy which aims to give the cultural and natural heritage a function in the life of the community." States Parties should recognize that inclusive social development is at the heart of the implementation of this provision of the convention. States Parties should further recognize that full inclusion, respect and equity of all stakeholders, including local and concerned communities and Indigenous Peoples, together with a commitment to gender equality, are a fundamental premise for inclusive social development. Enhancing quality of life and well-being in and around World Heritage properties is essential, considering communities who might not visit or reside in or near properties but are still stakeholders. Inclusive social development must be underpinned by inclusive governance.[58]

## 3. Environmental protection

One of UNESCO's unique features within the United Nations system is its ability to mobilize its designated sites to contribute to the SDGs through environmental protection and conservation. All three types of UNESCO site-based designation can contain natural protected areas (see Box 4), either partially or entirely, and can be subject to sub-national and national legislation and protection mechanisms.

UNESCO designated sites also contain tangible and intangible cultural elements, including protected monuments and buildings, cultural practices and traditions. These cultural elements bring important considerations when it comes to environmental protection, whether that is through retrofitting, helping communities understand and relate to the impacts of climate change, mitigating changes to cultural landscapes, or preserving traditional knowledge systems.

For example, the Joint Programme between UNESCO and the Convention on Biological Diversity Secretariat,[59] which links biological and cultural diversity, recognizes that cultural practices depend upon specific elements of biodiversity for their existence and expression, while ensembles of biodiversity are developed, maintained and managed by cultural groups. This includes biocultural heritage – the knowledge and practices of Indigenous Peoples and their biological resources, from the genetic crop varieties they develop to the landscapes they create[60] (see Box 5).

### Box 4: Natural protected and conserved areas

One of the main mechanisms through which international agreements on natural and cultural heritage have been translated into practice at the national and local level since the 1960s is the proliferation and creation of protected areas.

From roughly 9,000 sites in 1962, the number of "protected areas" has grown to more than 269,000 designated marine and terrestrial protected areas in more than 248 countries and territories today. These are estimated to cover more than 30 million square kilometres collectively.[61] Protected areas take many different forms and fulfill multiple conservation objectives. They can include, but are not limited to, national parks, wilderness areas, protected landscapes and nature reserves. The World Heritage Convention is the only normative instrument (apart from the Ramsar Convention[62]) dedicated to protecting both cultural and natural heritage and the only one connecting both types of heritage. Sites can include both cultural assets and natural protected areas.

There have been many attempts to define and categorize "protected areas." The IUCN defines a protected area as:

**"a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values."[63]**

The organization also provides guidance for categorizing protected areas.[64]

The protection of these areas takes centre stage in international legal agreements, such as the Convention on Biological Diversity (Aichi Target 11) and the UN SDGs (Goals 14 and 15).

Children playing in the Tsá Tué Biosphere Reserve (Canada) – the world's first Indigenous-led biosphere reserve.
Saoyú-ʔehdacho National Historic Site, Northwest Territories / Fritz Mueller

## Box 5: Indigenous Protected and Conserved Areas in Canada

Indigenous Protected and Conserved Areas (IPCAs) are lands and waters (including ice areas) where Indigenous leadership is a defining attribute in the decisions and actions that protect and conserve an area.[65] These areas describe a variety of land protection initiatives in the Canadian context, including Tribal Parks, Indigenous Cultural Landscapes, Indigenous Protected Areas, and Indigenous conserved areas.[66]

The Tsá Tué Biosphere Reserve in Canada's Northwest Territories was designated in 2016. The area is the homeland of the Sahtuto'ine, or Bear Lake People. It encompasses Great Bear Lake, the last large pristine Arctic lake, and part of its watershed, which is mostly covered by boreal forest and taiga, the habitat of wildlife including muskox, moose and caribou. The site's only people are the First Nation Dene community of Dél̨ı̨ę, which means "where the water flows." Tsá Tué was the first biosphere reserve in the world to be nominated and completely managed by Indigenous People. In 2021, the site received funding from the Canadian government to conduct preliminary work related to establishing an IPCA to protect Great Bear Lake, located at the heart of the biosphere reserve.

Fort Folly First Nation and Fundy Biosphere Reserve in New Brunswick, Canada also received funding under the Canada Nature Fund to establish a network of IPCAs that would represent and reflect the cultural and ecological values of the First Nation and provide tangible platforms for its people to be active stewards and put two-eyed seeing[67] into practice. This work is focusing on culturally significant areas as well as critical habitat of the endangered inner Bay of Fundy Atlantic salmon. The IPCAs will provide a living laboratory in which Indigenous guardians – who focus on biodiversity conservation and cultural preservation as two halves of a whole – can monitor and measure the impacts of protection and conservation. This work represents a significant step forward in Canada's reconciliation with Indigenous People and the land. Reconciliation is being advanced by focusing on shared goals, building capacity in communities and working together meaningfully on a Nation-to-Nation basis.

A biosphere reserve must have three clearly defined zones:

- a core area (or areas) comprising a strictly protected zone that helps conserve landscapes, ecosystems, species and genetic variation
- a buffer zone(s) that surrounds or adjoins the core area(s) and is used for activities compatible with sound ecological practices that can reinforce scientific research, monitoring, training and education
- a transition area where communities can foster socio-culturally and ecologically sustainable economic and human activities

The core area(s) should have legal protection to ensure nature conservation is prioritized. The degree of protection follows national, provincial, local and customary laws and regulations on nature conservation, land use and other factors. Buffer zones – in whole or in part – should also have specific regulations, arrangements or circumstances that fulfill their function to buffer the core areas from conservation threats.

The defining geological heritage sites within a UNESCO global geopark must be legally protected according to local, regional or national legislation. In their nomination and revalidation documents, geoparks should identify a strategy for protecting their geological heritage through law and education.

The World Heritage Convention is legally binding upon the 194 countries that have agreed to it.[68] As with biosphere reserves and geoparks, "legislative and regulatory measures at national and local levels should assure the protection of the property from social, economic and other pressures or changes that might negatively impact the Outstanding Universal Value, including the integrity and/or authenticity of the property."[69] World Heritage Sites must have clearly delineated boundaries, and may also have buffer zones that place complementary legal and/or customary restrictions on the site's use and development for added protection.

## 4. Bridging global and local

UNESCO designated sites work with numerous stakeholders, roles and functions, and effectively form a bridge from local to global and vice versa (Figure 2).

The Black Country UNESCO Global Geopark is made up of 40 national and cultural designated sites.
Saltwells Local Nature Reserve interpretation panel / Black Country UNESCO Global Geopark, UK

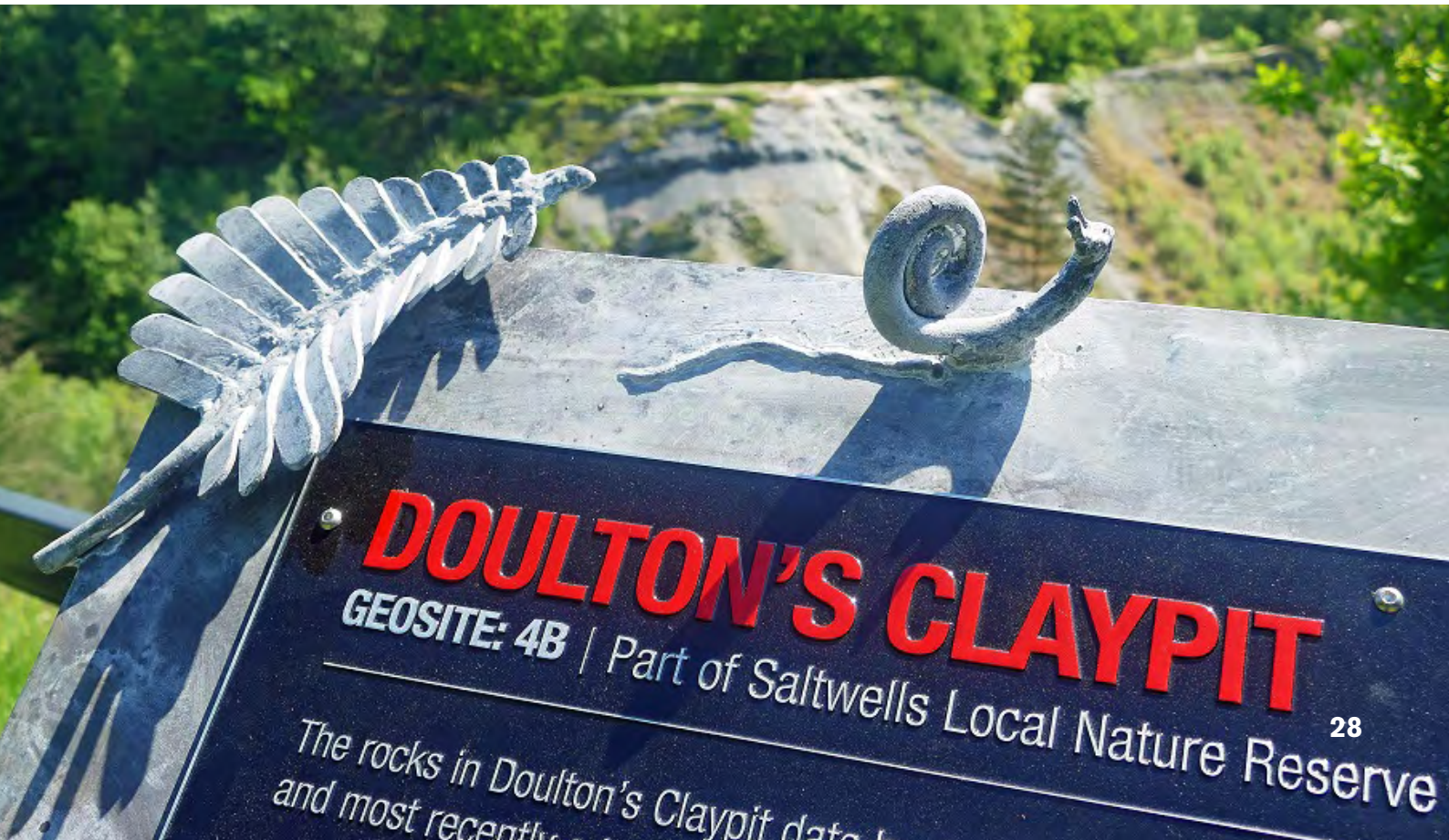
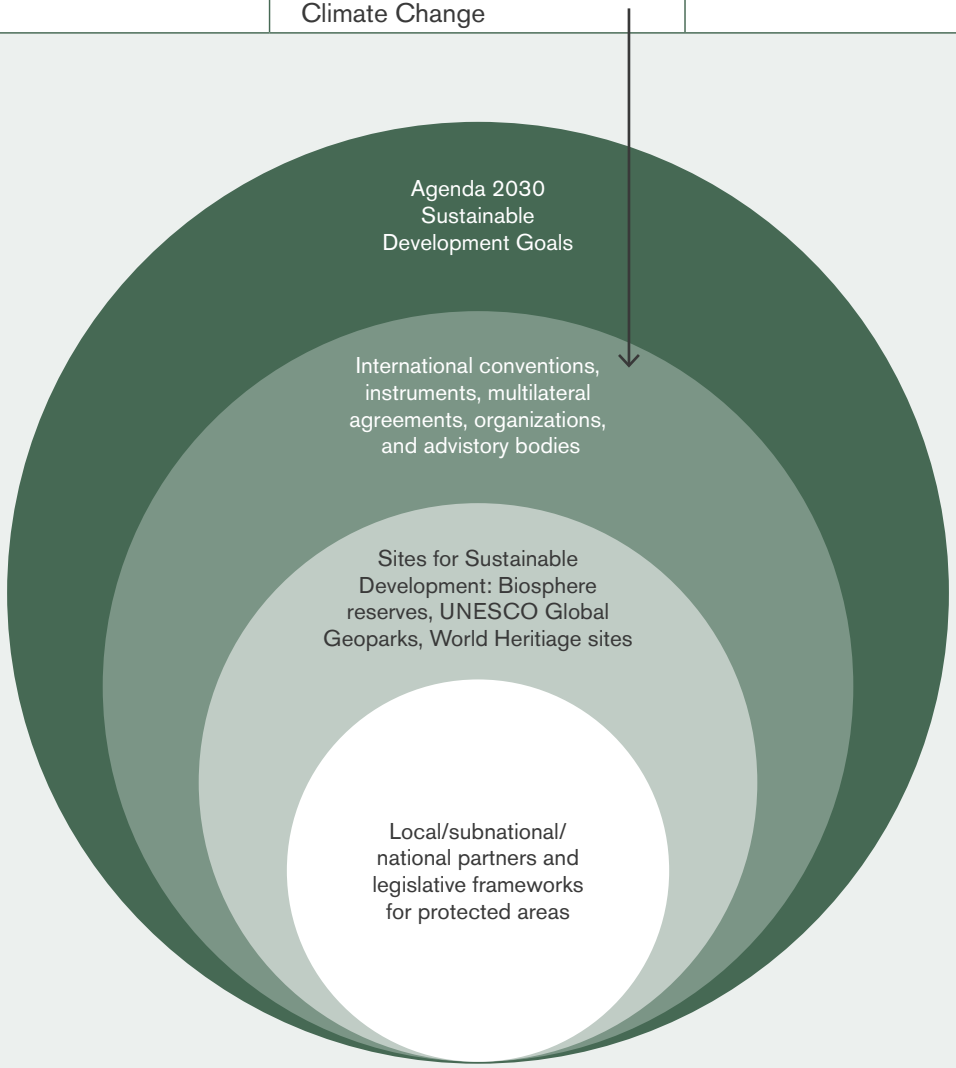


**Figure 2. International programmes and agreements help UNESCO designated sites form bridges from local to global and vice versa.**

| **International organizations and agencies:** | **Natural environment-related conventions:** | **Culture-related conventions:** |
|---|---|---|
| • International Union for the Conservation of Nature<br>• International Union of Geological Sciences<br>• Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services<br>• International Council on Monuments and Sites<br>• International Centre for the Study of the Preservation of Cultural Property<br>• UNESCO<br>• UN Development Programme<br>• Other UN Agencies and Programmes | • World Heritage Convention<br>• Convention on Biological Diversity<br>• Ramsar Convention on Wetlands<br>• Convention on the Conservation of Migratory Species of Wild Animals<br>• Convention on International Trade in Endangered Species of Wild Fauna and Flora<br>• International Plant Protection Convention<br>• International Treaty on Plant Genetic Resources for Food and Agriculture<br>• International Whaling Commission<br>• UN Framework Convention on Climate Change | • World Heritage Convention<br>• Safeguarding of the Intangible Cultural Heritage<br>• Convention for the Protection of the Underwater Cultural Heritage |



In 2018, the Intergovernmental Panel on Climate Change highlighted the importance of involving local populations in adaptation strategies in its special report, *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation.*[70] Additionally, in 2020, a report by the Organisation for Economic Co-operation and Development[71] found that at least 105 of the 169 SDG targets will not be reached without proper engagement and coordination with local and regional governments. The report outlined a framework to reshape sustainable development policies from the ground up and recommended engaging all civil society actors to define local and regional development visions and strategies.

UNESCO designated sites are at the heart of this framework of engaging local actors to advance global sustainable development actions. An ideal situation would be one in which UNESCO designated sites within each Member State receive full support to fulfill their mandates, both individually and collectively. Under the umbrella of an international designation – and operating within national policies, strategies and legislation – local actors would translate global objectives into actions at individual sites. Conversely, the sites' local needs, aspirations and cultures would provide input to national visions, development goals and objectives, which determine Member States' contributions to global goals and agreements. Sites must be fully supported to realize this ideal situation.

In summary, the mandates of UNESCO designated sites to promote economic development, social inclusion and environmental protection – combined with their actions at the global, local and people levels – place them at the nexus of science, society and development and, therefore, at the heart of Agenda 2030.

The Slate Landscape of Northwest Wales (UK) was designated a UNESCO World Heritage site in 2021. Situated in Snowdonia National Park, the management partnership will work to increase pride in local communities, regenerate the landscape from an economic and social perspective, and promote Welsh language and culture. / Wirestock

# 3

# Sites for sustainable development: Participatory approaches to management

## Highlights

- UNESCO's grouping of its designated sites as sites for sustainable development is justified by the sites' mandates, strategies and structures.

- UNESCO designated sites involve a wide range of stakeholders in participatory approaches to manage the environmental, cultural, social and economic dimensions of landscapes and places.

- This section outlines the five requirements of UNESCO designated sites that can significantly improve their suitability as ideal places to implement sustainable development approaches. All three types of designated sites are required to: identify and engage stakeholders and rights holders, establish common concerns, develop iterative and adaptive management plans, monitor and report on progress, and mobilize knowledge locally, regionally and internationally.

Community planning at the Manicouagan-Uapishka Biosphere Reserve, Canada

River restoration at Threave Estate – National Trust for Scotland with Galloway Glens Landscape Partnership.
Galloway and Southern Ayrshire UNESCO Biosphere, UK / The Galloway Glens Landscape Partnership

The attributes that place biosphere reserves, geoparks and World Heritage Sites at the heart of Agenda 2030 are their individual and collective mandates to:

- operate across sectors
- approach land use and human development holistically
- ensure a wide range of stakeholders and rights holders participate in, coordinate and manage sites

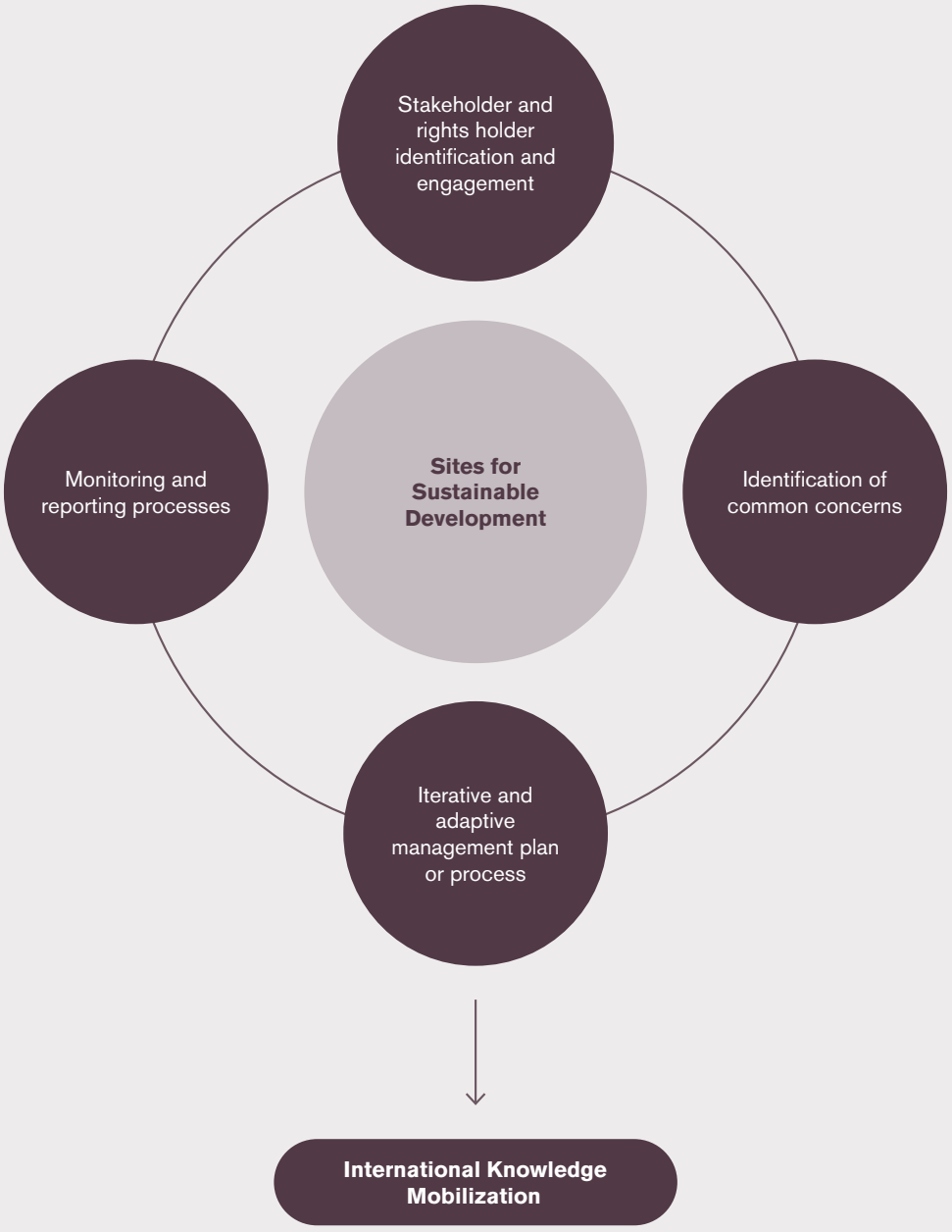
This is illustrated by the example in Case Study 1.

UNESCO designated sites are mandated and called upon to share the lessons learned during participatory approaches at the local level with other members of the international networks to which they belong. This reinforces the bridges between global and local that are important for advancing sustainable development.

Operationalizing the sustainable development agenda into practice at the local level has proven to be challenging in key documented examples.[72] One method is to adopt integrated landscape approaches, described as "governance strategies that attempt to reconcile multiple and conflicting land-use claims to harmonize the needs of people and the environment and establish more sustainable and equitable multi-functional landscapes."[73] While local factors determine the exact components, recent studies have outlined the following key attributes or themes of successful integrated landscape approaches: the involvement of multiple stakeholders; the ability to establish common concerns; the presence of a multi-stakeholder forum/negotiated and transparent change logic; participatory monitoring and evaluation systems; and an iterative and adaptative approach to management.[74] These are all attributes of UNESCO designated sites, as illustrated in Figure 3. The fact that these attributes constitute the success of UNESCO designated sites in operationalizing sustainable development has been confirmed in other non-academic sources, including the *Technical Guidelines for Biosphere Reserves*[75] and the *Management Manual for UNESCO Biosphere Reserves in Africa.*[76]

The next few subsections describe the alignment between these attributes and UNESCO guidelines for each type of designated site.

**Figure 3. Sites for sustainable development: UNESCO designated sites are managed in integrated and participatory ways. A key feature is their membership in international networks that facilitate knowledge mobilization, allowing them to share their experiences and learn from other sites.**



Aerial view of Dudley Castle, Dudley. Black Country UNESCO Global Geopark, UK. / UAV4

## Case study 1: Black Country Geopark, UK

The Black Country UNESCO Global Geopark in the Midlands of the UK was designated in 2020. The site consists of 40 natural and cultural designated sites in an area covering 256 square kilometres that is also home to more than 1.1 million people in 200 communities. Collectively, these sites show the natural geological processes that formed Black Country's landscape over millions of years and the human and industrial processes that played a significant role in creating the modern world during the 18th and 19th centuries.

For Graham Worton, Keeper of Geology at Dudley Council, Black Country's designation as a UNESCO global geopark in 2020 allowed the area's cultural and natural "pearls" to be connected under one designation and narrative.

The designation has also allowed for greater integration between some of the largest and most influential organizations responsible for the region's biodiversity, geodiversity, river catchment partnerships and industrial heritage. "The power of the geopark network is that you bring bigger and diverse thinking into one place," says Worton.

Worton sees the geopark as a convener, bringing related geological, natural and cultural sites together into a management board that has a wider vision and can better consider issues across the site. Each Site of Special Scientific Interest or Local Nature Reserve has an individual management plan and local reporting process, but these often sit in isolation, managed individually or as a small local authority or heritage trust "managed cluster" within the overall landscape. The importance of the global geopark is its ability to bring together natural and cultural sites or small local clusters (that would otherwise be disconnected) into a larger, more inclusive narrative. For example, although the management of uncontrolled development,

inappropriate site uses, and pests and diseases are well-established activities in local planning systems and management practices, the geopark has allowed local authorities and wider stakeholders to join forces to better manage these threats.

Black Country's designation as a geopark has allowed its management team and partners to better deliver conservation activities to communities at the grassroots level. This is important because the biggest threat faced by any cultural or natural site is neglect, when "people don't care, and things are allowed to decay," says Worton.

"If we don't help people see the wonder of it all, then we've failed," he says. "The geopark connects things and makes the landscape meaning richer and deeper for local communities. It's not just a castle on the hill – it becomes the story of a hill on which a castle was built with local resources and talent, and then the story of people who lived in and around that castle and onwards to its future uses."

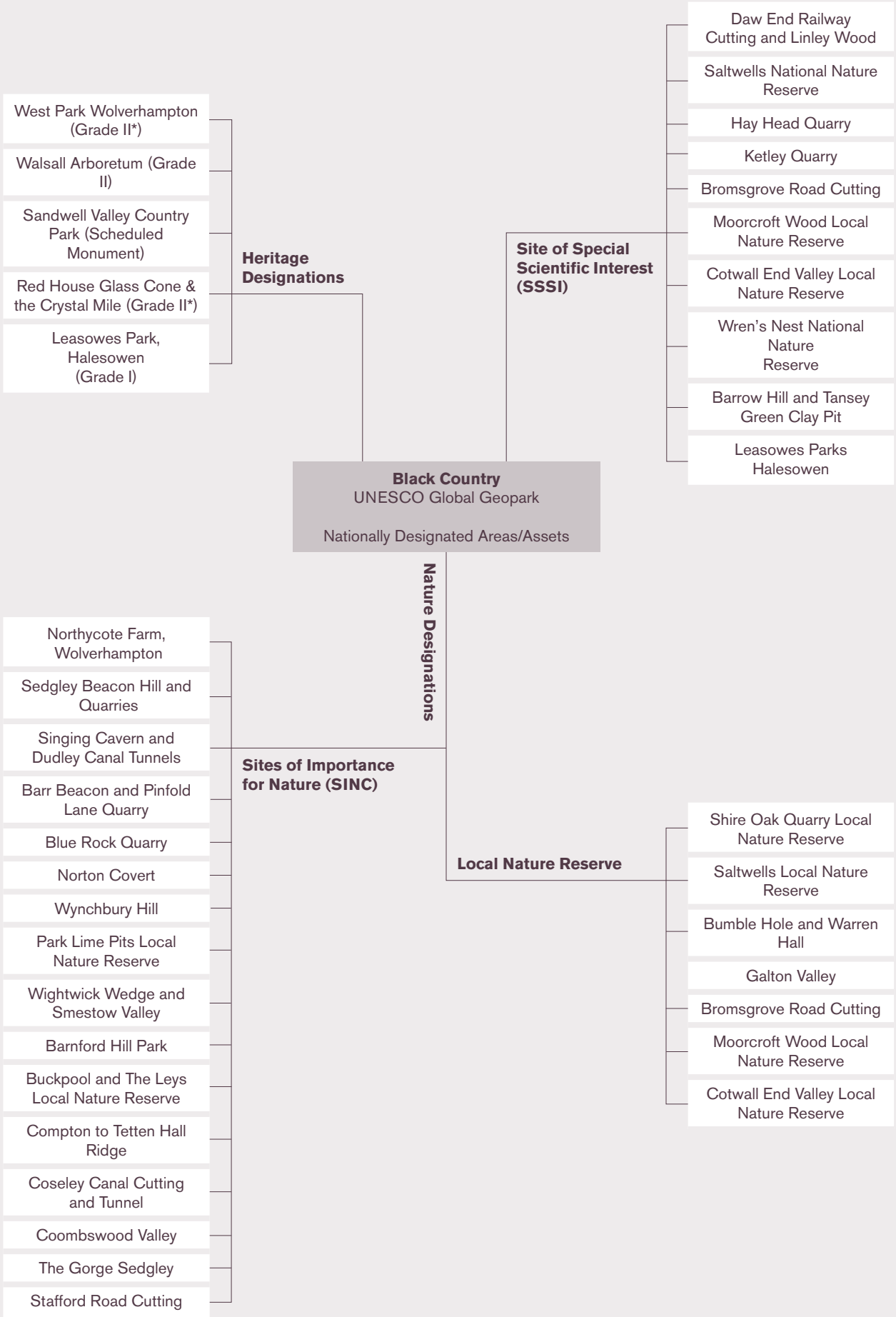
Key to the future of the Black Country UNESCO Global Geopark is its high-level strategic integration into the wider long-term development process expressed in the Black Country Plan. This is a formal 30-year development plan for Black Country that, in a first, includes specific policy and multiple cross-references to the geopark.

Worton explains:

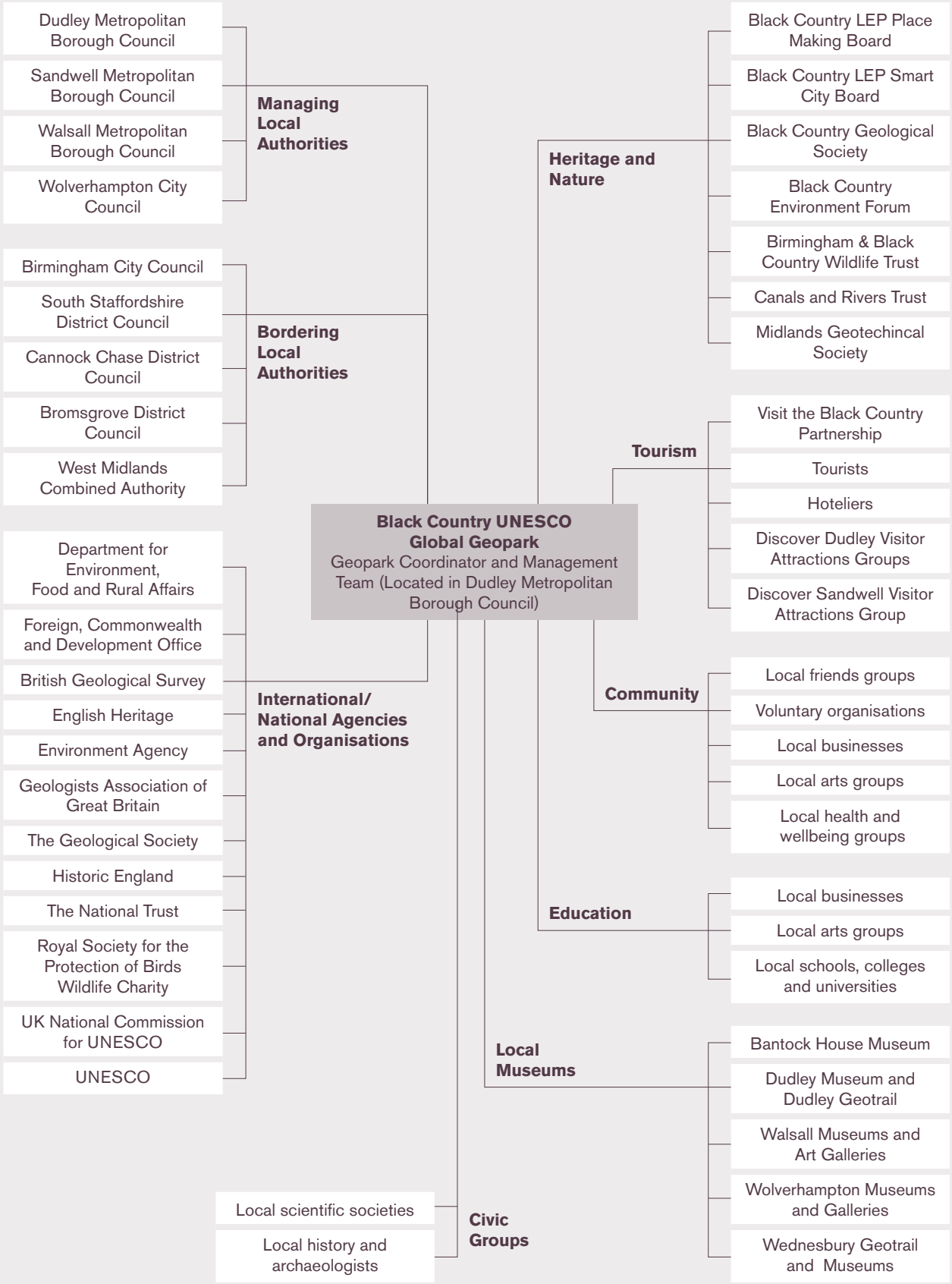
**"In these partnerships, very big agendas, such as future energy and water supply for the Black Country, zero carbon and climate change, and so on, are being discussed in forward-thinking, innovative ways. We are beginning to explore how the geopark can be a voice or bridge between the strategic level and local people in delivering those messages and helping with the transition to that greener, happier, more secure future."**

Community field trip to Wren's Nest National Nature Reserve led by Graham Worton / Black Country UNESCO Global Geopark, UK

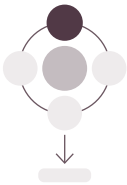
**The Black Country UNESCO Global Geopark is made up of a range of cultural and natural heritage protected areas and assets.**



**The Black Country UNESCO Global Geopark Site management team (located in Dudley Council) brings a range of stakeholders together to manage, participate and benefit from the area's geopark status. These range from those responsible for protected areas to local authorities, tourism agencies, local arts groups and schools.**



# 1. Identifying and engaging stakeholders and rights holders



## Table 2. Expectations for identification and engagement of stakeholders and rights holders by sites

| Biosphere reserve | Global geopark | World Heritage Site |
|---|---|---|
| "Organizational arrangements should be provided for the involvement and participation of a suitable range of inter alia public authorities, local communities and private interests in [designing] and carrying out the functions of a Biosphere Reserve."[77] | "It is recommended that all relevant local and regional actors and authorities be represented in the management of a UNESCO Global Geopark."[78] | "Promote and encourage the effective, inclusive and equitable participation of the communities, Indigenous Peoples and other stakeholders concerned with the property as necessary conditions to its sustainable protection, conservation, management and presentation."[79] |

UNESCO designated sites must have broad community and stakeholder engagement at the heart of their activities and management. We define stakeholders to include local communities, local umbrella organizations (such as farmers' groups), statutory agencies and their local branches (such as forestry or planning agencies with responsibility for monitoring and protecting cultural and natural assets), businesses (including those that own such assets), and councils of elected officials (see the Clayoquot Sound Biosphere Trust example, Figure 6). In states and countries with Indigenous Peoples and their organizations and/or traditional authorities, their inclusion is of paramount importance.

Furthermore, UNESCO designated site managers must bring these stakeholders together in multi-stakeholder forums or management committees. This means that broad stakeholder consultation and participatory approaches are built into how designated sites operate, function and meet their requirements.

A consistent feature of both biosphere reserves and geoparks is that people live within the boundaries of these designated areas. The Lima Action Plan places "strong emphasis on thriving societies in harmony with the biosphere."[80] The criteria for UNESCO global geoparks state that the parks "should actively involve local communities and Indigenous Peoples as key stakeholders."[81]

Although some World Heritage Sites do not have communities living within them (for example, some are individual monuments), many do. Whatever the status of the population within the boundaries of a designated site, the Operational Guidelines for the Implementation of the World Heritage Convention[82] require community participation where applicable. Indeed, UNESCO added communities as a fifth strategic objective (alongside credibility, conservation, capacity-building and communications) to the Budapest Declaration on World Heritage in 2007.[83] Moreover, the Policy for the Integration of a Sustainable Development Perspective into the Processes of the World Heritage Convention[84] recommends that sites may need to act at a scale that is larger than the property itself to apply all of the dimensions (economic, environmental and social) of sustainable development.

Within the boundaries of a UNESCO designated site, there can be many different stakeholders and rights holders with varying degrees of authority, financial resources, ownership and influence. In a recent study, the UK National Commission for UNESCO identified that, at the very least, some 1,300 businesses, communities and organizations directly work with UNESCO designated sites in the UK in formal management structures. The commission also found the UNESCO network is unrivalled in its ability to connect the local with the international and create mechanisms to develop opportunities for learning, engagement and joint activities.[85] One of the difficulties when creating and sustaining a UNESCO designated site is determining how site managers work effectively with all of these stakeholders and rights holders, through participatory and inclusive

means, to coordinate and meet the site's objectives. Therefore, the site manager's ability to successfully identify, engage and coordinate with multiple stakeholders and rights holders and understand their needs and challenges is key to the success of a UNESCO designated site.

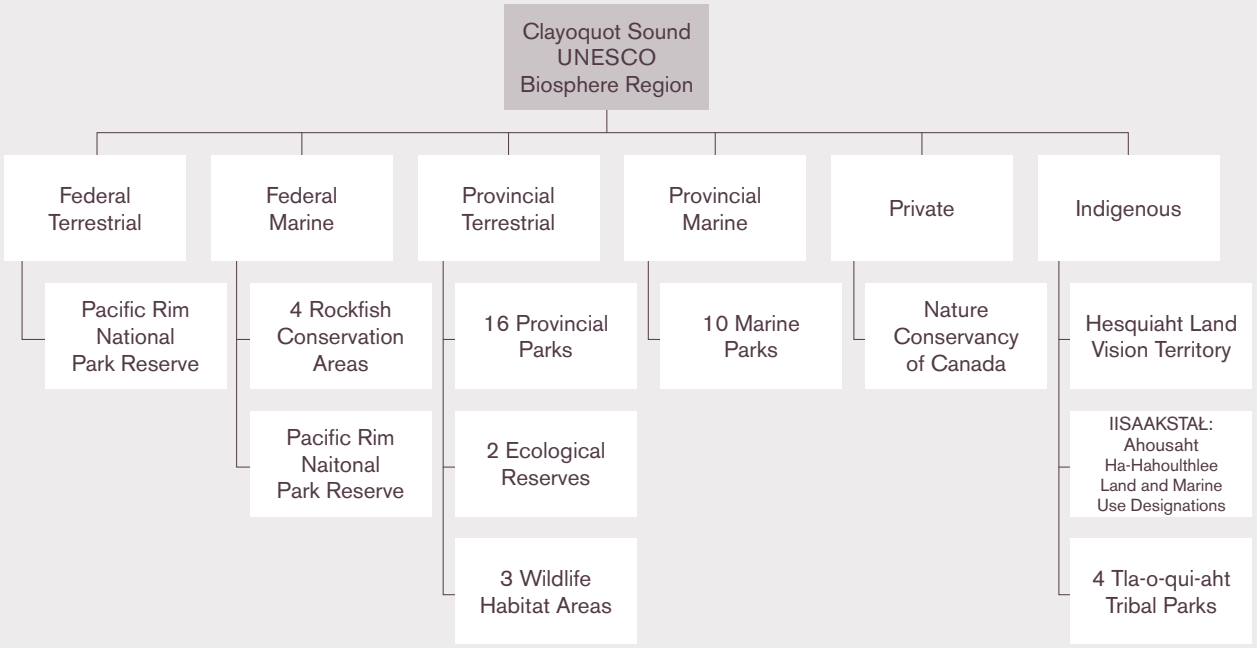
Using the Clayoquot Biosphere Trust as an example, Figure 6 illustrates the range of stakeholders and rights holders with whom UNESCO designated site managers may engage.

Figure 7 maps the various organizations involved in the Clayoquot Biosphere Trust. It is important to note that the categories are somewhat artificial because many organizations and groups have multiple roles within the biosphere region, such as representing local interests, initiating conservation activities and providing environmental education programs.

The Clayoquot Biosphere Trust used its most recent periodic review[86] to deepen its engagement with its partners and celebrate their successes. Support for stakeholders and rights holders and stories about their work were turned into a story map[87] that elegantly illustrates their shared contributions to the biosphere region.

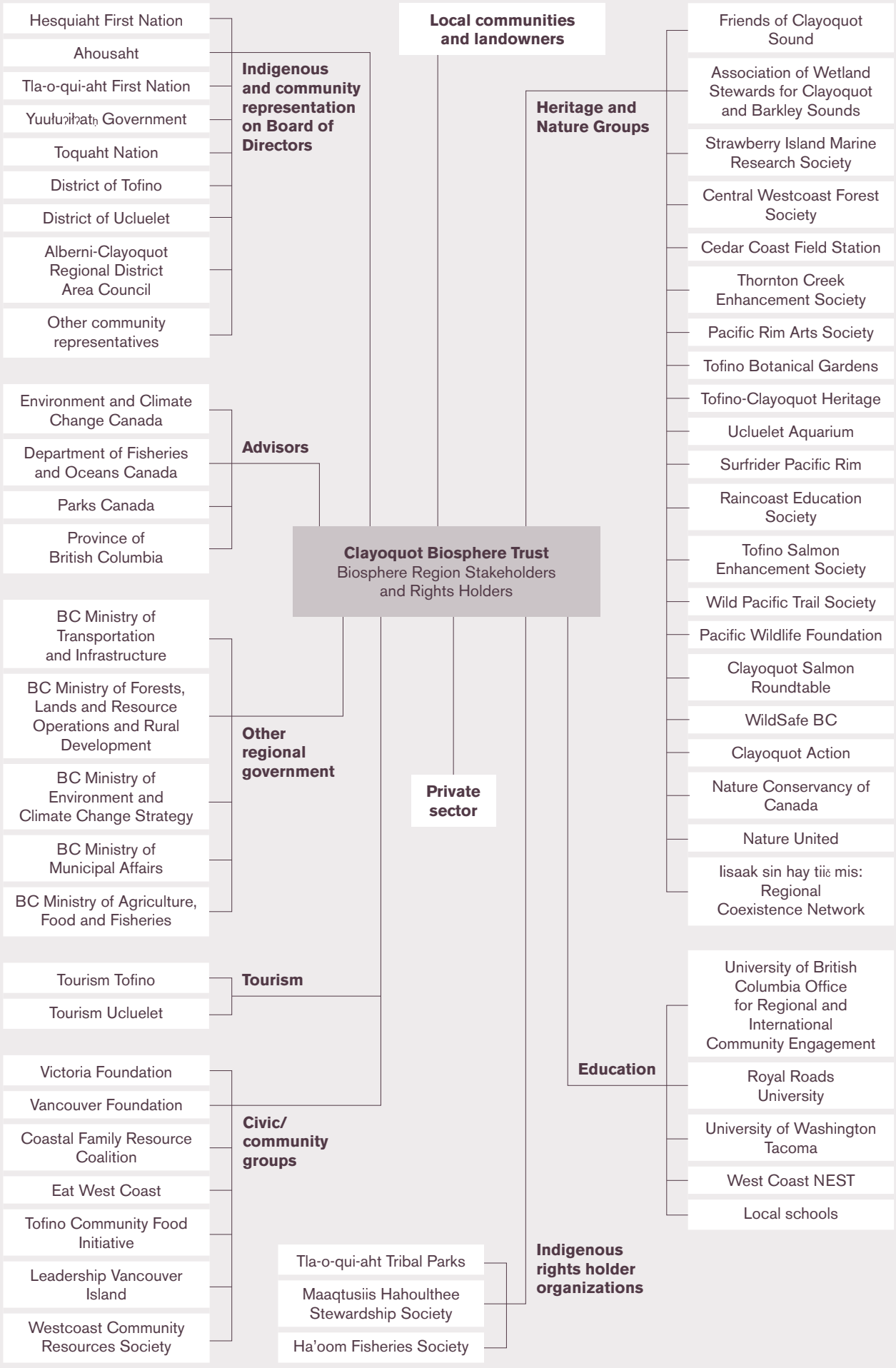
Hišiqʷiił Regional Gathering, Clayoquot Sound Biosphere Region, British Columbia, Canada, September 2017. / Melody Charlie

**Figure 6. The Clayoquot Biosphere Trust is a community foundation that oversees the Clayoquot Sound UNESCO Biosphere Region[a], located on Vancouver Island, British Columbia, Canada. The protected areas categorized as part of its core and buffer areas fall under multiple jurisdictions, including federal, provincial, private and Indigenous.**




a Note that UNESCO biosphere reserves in Canada are increasingly replacing the term "reserve" with "region." This is in part because the term "reserve" can cause confusion by suggesting that people are excluded from the area, as with a nature reserve. In addition, the term "reserve" has historic negative associations because of the forcible removal of Indigenous Peoples from their lands.

**Figure 7. Biosphere regions (like Clayoquot Biosphere Trust, Canada, shown here) have relationships with multiple layers of stakeholders and rights holders.**



Landscape of Tofino covered in greenery surrounded by the sea in the Vancouver Islands, Clayoquot Sound UNESCO Biosphere Region, Canada / Wirestock

## 2. Establishing common concerns

### Table 3. Requirements for identifying threats and challenges within designated sites

| Biosphere reserve | Global geopark | World Heritage Site |
|---|---|---|
| Periodic reviews require sites to identify obstacles encountered in the management and coordination of the reserve as well as challenges to its effective functioning and factors that negatively influence its conservation, development and logistic operations. | During revalidation, geoparks are asked to analyze the situation of the natural, cultural and intangible heritage of the area and how it is valued, interpreted, promoted and maintained. | There are two monitoring and reporting processes in place for the World Heritage Convention: reactive monitoring and periodic reporting.[88] The latter asks sites to report on the presence of 82 *specific threats* organized across 13 categories (see page 62). |

UNESCO designated sites identify and manage threats and challenges to their designated areas individually and collectively. They experience global challenges and play a role in developing innovative and sustainable solutions to mitigate or adapt to them. Indeed, UNESCO designated sites, which cover more than 10 million km$^2$ and have hundreds of millions of people living in communities within their boundaries, are affected by the same global challenges faced by all. Their high visibility allows them to act as communicators for these challenges and concerns, as well as for possible solutions.

There is little doubt that climate change is the most important common concern for people around the world at present. At the level of UNESCO and its designated sites, this has been recognized through research and governing body decisions. The 2021 IUCN World Heritage Outlook found that the greatest threat facing natural World Heritage Sites globally is climate change.[89] The impacts of climate change are also affecting UNESCO global geoparks[90] and biosphere reserves.[91]

Identifying common concerns is a key component of periodic reporting processes. Aside from these statutory requirements, the process of establishing common concerns helps sites engage stakeholders and rights holders and identify priorities to incorporate into management plans (see Box 6).

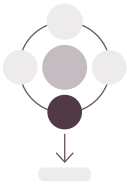
## Box 6: The Nchu'ú7mut/Unity Plan

The Átl'ka7tsem/Howe Sound Biosphere Region was designated in September 2021. One of the first major initiatives for the region was the development of the Nchu'ú7mut/Unity Plan,[92] a land and marine use plan that is being co-created with First Nations, multi-sectoral stakeholders and local communities using a collaborative, participatory approach.

The Howe Sound Biosphere Region Initiative Society produced a discussion paper derived from UNESCO's Technical Guidelines for Biosphere Reserves. This is being widely shared with the community, stakeholders and rights holders, all of whom can submit feedback about the biosphere region's strategic goals through an online form. One of the priorities for the organization is to identify opportunities and threats that have not yet been reflected in their current plans and processes.

The Nchu'úi7mut/Unity Plan, British Columbia, Canada, Howe Sound Biosphere Region Initiative Society

# 3. Developing iterative and adaptive management plans



## Table 4. Requirements for management policies and plans for UNESCO designated sites

| Biosphere reserve | Global geopark | World Heritage Site |
|---|---|---|
| Article 4 of the Statutory Framework of the World Network of Biosphere Reserves states that provisions should be made for "a management policy or plan for the area as a Biosphere Reserve."[93]<br><br>The Lima Action Plan states: "[Biosphere reserve] management plans produced and implemented through participatory approaches, considering local and indigenous practices, traditions and cultures, and based on sound science."[94] | "A co-management plan needs to be drafted and implemented that provides for the social and economic needs of local populations, protects the landscape in which they live and conserves their cultural identity. It is recommended that all relevant local and regional actors and authorities be represented in the management of a UNESCO global geopark. Local and Indigenous knowledge, practice and management systems should be included, alongside science, in the planning and management of the area."[95] | "Each nominated property should have an appropriate management plan or other documented management system which must specify how the Outstanding Universal Value of a property should be preserved, preferably through participatory means."[96] |

Management plans are valuable tools for sustainably managing landscapes, properties and areas that incorporate tangible and intangible cultural heritage, nature and protected areas. For example, biodiversity outcomes in protected areas are improved by effective management plans.[97] They are needed to identify and balance often competing environmental, society and development needs. All three types of UNESCO designated sites require management plans that are participatory in nature and cover the entire designated landscape or area, including its protected and conserved areas. These management plans provide the framework for transforming goals into coherent, actionable plans and enable site managers to access the necessary resources, identify stakeholders and establish partnerships.

The key provisions relating to management plans within biosphere reserves are contained in the Statutory Framework of the World Network of Biosphere Reserves[98] (Article 4.7.b) and section 4.1 of the Technical Guidelines for Biosphere Reserves.[99] Importantly, biosphere reserves should involve all the various stakeholders in planning and decision-making and provide training to enable meaningful participation. Given that a management plan should also accommodate the principles of adaptive management, it should be updated at regular intervals.

Geopark management plans are framed as co-management plans, reinforcing the importance of developing them in participation with stakeholders and rights holders. They should contain strategies relating to personnel and capacity-building, geoconservation, heritage interpretation infrastructure, education and tourism activities, sustainable local development, promotion, and networking and partnerships.[100]

One of the ongoing sustainable development challenges facing many World Heritage Sites is the need to protect cultural and natural features that contribute to the sites' Outstanding Universal Value while also allowing for growth (e.g., new housing) and development. The sites' plans need to manage these challenges, involve local and Indigenous communities as much as possible, and ensure that heritage plays a dynamic role in society.[101,102] To achieve sustainable development, many World Heritage properties may need to apply management approaches to areas that are larger than the property itself.[103] Indeed, World Heritage Sites that are part of historic urban landscapes are tasked with applying "a landscape approach for identifying, conserving and managing historic areas within their broader urban contexts."[104]

# 4. Monitoring and reporting

## Table 5. Periodic assessments of UNESCO designated sites

| Biosphere reserve | Global geopark | World Heritage Site |
|---|---|---|
| A review conducted every 10 years assesses the functions of a biosphere reserve. The process requires each site to submit a detailed self-study that reports on the progress it has made toward fulfilling the criteria of the Statutory Framework of the World Network of Biosphere Reserves over the previous 10 years. Reports are assessed by an advisory committee and the program's International Coordinating Council to determine if they meet the criteria.[105] | A revalidation every four years examines the functioning and quality of a geopark. The revalidation process includes a progress report, self-evaluation and progress evaluation, and field mission. If the geopark is not fulfilling some of the criteria, it may receive a yellow card (in which case it must undergo another revalidation two years later) or a red card (in which case it must reapply for designation).[106] | Reactive monitoring is co-ordinated by the World Heritage Committee and its advisory bodies and produces state-of-conservation reports on specific properties under threat. Periodic reporting every six years is driven by States Parties, and assesses the application of the convention by the States Parties and provides updated information about the sites.[107] |

International revalidation of Marble Arch Caves UNESCO Global Geopark (UK) in 2016 / Kirstin Lemon

UNESCO periodically assesses whether UNESCO designations continue to fulfill the criteria, functions and mandates for which they were designated. Given the organization's commitment to results-based management,[108] these periodic assessments are increasingly important. They review all aspects of a site, including management, and identify existing and potential threats faced by the sites.

Each type of UNESCO designation has a different system for periodic reporting defined by the statutory documents of the programme (biosphere reserves, geoparks) or convention (World Heritage Sites) that caters to their specific mandates (see Table 5). For example, biosphere reserves must report on the conservation function and ecosystem services, while geoparks must report on geodiversity and measures for protecting geological heritage. World Heritage sites report on factors that affect the Outstanding Universal Value of the site (periodically or reactively). The frequency of reporting also varies. Biosphere reserves report every 10 years; however, the recently adopted Process of Excellence and Enhancement of the WNBR [World Network of Biosphere Reserves] as Well as Quality Improvement of All Members of the World Network[109] encourages the coordination of an interim review five years after the last periodic review. Geopark revalidations occur every four years, or after two years if concerns were raised during a previous revalidation. World Heritage Site periodic reporting occurs every six years, with reactive monitoring as and when required.

Monitoring and reporting require data. Biosphere reserves, global geoparks and World Heritage Sites are required to record and report certain basic geospatial data. These data are used to monitor the sites, assess the state of conservation, and contribute to decisions about interventions. They include details such as geographic coordinates, site size and boundary maps, demographics, land usage and more. Section 2 of the Supplementary Information document describes other potential uses of geospatial data in UNESCO designated sites.

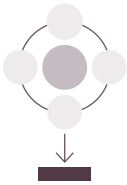
The various governing bodies in the UNESCO Secretariat hold the data associated with these periodic assessments. The MAB Programme is compiling data about biosphere reserves into a new database that will include quantitative data on the reserves and an interactive map.

The World Heritage Centre has a very well-developed database in the form of its State of Conservation Information System.[110]

In addition to the statutory monitoring and evaluation processes UNESCO requires, UNESCO designated site managers also collect data according to the needs they have identified in their management plans. For example, one of the ways in which the Clayoquot Biosphere Trust (see Figure 6) involves its many stakeholders and rights holders in its activities is through its Vital Signs report.[111] The report, published every two years, summarizes the state of many different indicators of community and ecosystem health and tracks these indicators against the SDGs. The research results and subsequent conversations with First Nations, municipal governments and organizations allow the Clayoquot Biosphere Trust to manage the needs of its diverse stakeholders and rights holders and identify priority areas for community-wide action.

Evaluation mission for the Cliffs of Fundy UNESCO Global Geopark, Canada / Eleanor Haine

# 5. Mobilizing knowledge locally, nationally and internationally



## Table 6. Recommendations for knowledge mobilization among UNESCO designated sites

| Biosphere reserve | Global geopark | World Heritage Site |
|---|---|---|
| Article 7 of the Statutory Framework of the WNBR says, "States participate in or facilitate co-operative activities of the Network, including scientific research and monitoring, at the global, regional and subregional levels."<br><br>Article 8 says, "States should encourage the constitution and co-operative operation of regional and/or thematic subnetworks of biosphere reserves."[112] | "UNESCO global geoparks are encouraged to share their experience and advice and to undertake joint projects within the GGN. Membership of GGN is obligatory."<br><br>"UNESCO … will encourage exchange of best practice between UNESCO global geoparks."[113] | "The World Heritage Committee with the support of the Secretariat will ensure appropriate coordination and information-sharing between the World Heritage Convention and other conventions, programmes and international organisations related to the conservation of cultural and natural heritage."[114]<br><br>The World Heritage Capacity Building Strategy[115] promotes networks for cultural and natural heritage professionals. The regional reporting[116] following the periodic reporting process also promotes regional reflections and co-operation. |

UNESCO designated site managers mobilize the knowledge and experience they gain at the local level within the national and international networks (or list, in the case of World Heritage Sites) to which they belong. This work reinforces the bridges between local and global that are important for advancing sustainable development. It also makes site managers largely unique in the UN system: no other UN body has so many sites globally with similar reporting processes, participatory approaches and means to share knowledge, mobilize funding and implement high-level UN strategies at the site level.

Biosphere reserves are part of the WNBR, within which there are regional and thematic networks. For example, biosphere reserves in Canada are members of the Canadian Biosphere Reserves Association, a national network. Biosphere reserves in the UK and Canada are members of the EuroMAB network, which comprises all the biosphere reserves in Europe and North America. Some of these biosphere reserves are also members of the World Network of Island and Coastal Biosphere Reserves.[117] The thematic networks, in particular, recognize that while individual biosphere reserves have unique natural, cultural, socio-economic and political characteristics, they have similar and specific problems that can be addressed using common approaches. Similarly, UNESCO global geoparks belong to the GGN,[118] whose members work together to exchange best practices and accomplish common projects. There are also four regional geopark networks (which organize activities such as regional conferences and capacity-building activities[119]) and national networks, such as the Canadian Geoparks Network.

Both the application dossier to become a UNESCO global geopark and the revalidation documents for existing geoparks contain questions related to international co-operation.

The World Heritage Information Network[120] is the global network of World Heritage information providers. It was created in 1995 to foster the exchange of information between partner networks and World Heritage Sites around the world. The recently established Our World Heritage network aims "to protect heritage, support

knowledge-based decision-making, promote good governance and engage civil society,"[121] and has a focus on mobilizing civil society and younger generations to engage with the convention. Thematic networks are promoted through programmes such as the World Heritage Marine Programme, the World Heritage Cities Programme and the Sustainable Tourism Programme.[122]

International knowledge-sharing is an important component of sites for sustainable development because it allows lessons learned from one site to be applied to others within the global networks of all three designations. Meetings or conferences of the global, regional and thematic networks are opportunities for site managers to share knowledge and exchange best practices. Box 7 provides examples of initiatives in which international knowledge-sharing has facilitated capacity development and learning between sites, often on shared sustainable development challenges.

To summarize, UNESCO's grouping of its designated sites as sites for sustainable development is justified by the sites' mandates, strategies and structures. Sites contribute towards sustainable development through their holistic, integrated and participatory approaches to managing the environmental, social and economic dimensions of landscapes and places. Case study 2 provides a concrete example of what this looks like in practice by showing how a World Heritage Site provided the structures that allowed stakeholders and communities to address sustainable development threats.

The next section of this report examines, by way of original research and case studies, the sustainable development threats now facing UK and Canadian designated sites and the capacity of site managers to ensure the sites play their expected role in sustainable development.

Palawan Biosphere Reserve in the Philippines is part of an international project to research and test ways to manage marine ecosystems sustainably and lift people out of poverty / DreamArchitect

## Box 7: Examples of knowledge-sharing between UNESCO designated sites

### Blue Communities

Three UNESCO biosphere reserves in southeast Asia are at the heart of a four-year, £6.7M (USD $8.2M) international project to research and test ways to manage marine ecosystems sustainably and lift people out of poverty. Tropical marine and coastal ecosystems provide jobs, food and well-being for millions of people in southeast Asia. But many families remain trapped in poverty as the marine resources they depend on dwindle due to destructive practices, over-harvesting and the deterioration of ecosystems. The Blue Communities project[123] involves 10 partner organizations from the UK, Malaysia, Vietnam and the Philippines, resulting in a collaboration between 115 researchers. The team works on case study sites in biosphere reserves in Indonesia, Vietnam, the Philippines and the Tun Mustapha Marine Park in Malaysia, all of which face common sustainable development challenges. The sites are also collaborating and learning with North Devon Biosphere in the UK. Initiatives are developed and tested with local stakeholders with the aim of sharing successful approaches with other coastal communities in the wider UNESCO Biosphere Reserve network and elsewhere.

### Drifting Apart

Drifting Apart[124] was a project to strengthen the understanding, appreciation and enjoyment of the geological heritage of the Northern Periphery and Arctic region, and its many links to natural, built and cultural heritage. It brought together partners from Northern Ireland, Scotland, Canada, Norway, Iceland and Russia to promote innovative products and services for social and economic prosperity and to build a strong network of geoheritage destinations in the region. Outputs of the project included toolkits related to community involvement, education, tourism and sustainable site management.

### SHAPE (Sustainable Heritage Areas: Partnerships for Ecotourism)

The SHAPE[125] project involved biosphere reserves, a World Heritage Site, a regional park and universities from Canada, Finland, Greenland, Iceland, Norway and the UK. It aimed to enable authorities, businesses and communities to develop innovative approaches for ecotourism initiatives in sustainable heritage areas of the Arctic. The project addressed common challenges shared by partners, including a lack of visitors (or conversely, in some cases, too many), outward migration of young people, and climate change, among others. The project involved mapping assets, solving local challenges, building on existing activities and helping those who are in the process of developing new visitor experiences. The stakeholders shared the results of their experiences with each other through learning journeys, conferences and meetings, by establishing thematic networks, and by establishing a dynamic knowledge database.

### RURITAGE

RURITAGE is a four-year, EU-funded research project initiated in June 2018 that strives to enable rural regeneration through heritage. The project aims to sustainably enhance local heritage for regional and community development. The intention is to regenerate rural areas with the help of the Systemic Innovation Areas framework, which identifies unique heritage potential within rural communities. The project involves World Heritage Sites, global geoparks and other partners across Europe. The recognized Systemic Innovation Areas are pilgrimage, resilience, sustainable local food production, integrated landscape management, migration and art and festivals.[126]

Left: The city of Heraklion, Crete, Greece, looking out to the Psiloritis UNESCO Global Geopark. Part of the RURITAGE project / Juli Kosolapova
Right: Kujataa, a subarctic farming landscape and UNESCO World Heritage site, located in Greenland. Part of the SHAPE project / Frank Busch

The river Skell breaches its banks on the east green of the abbey at the Fountains Abbey and Studley Royal UNESCO World Heritage Site, UK / National Trust

## Case study 2: Fountains Abbey and Studley Royal UNESCO World Heritage Site, Yorkshire, England

Fountains Abbey and Studley Royal UNESCO World Heritage Site and its surrounding landscape is facing increasing problems with flooding and other climate-related issues. Sitting in the Skell Valley in Yorkshire, England, this World Heritage Site is within the administrative boundaries of North Yorkshire and Harrogate Borough. It encompasses several cultural assets including 52 listed buildings, a scheduled monument, a Grade I Special Historic Interest on the Register of Historic Parks and Gardens, and other natural heritage assets, including the Nidderdale Area of Outstanding Natural Beauty and four Sites of Importance for Nature Conservation. The World Heritage Site management team in the National Trust brings these different assets and associated stakeholders together to manage the area holistically for future generations (Figure 8).

The area suffers from repeated flooding. Businesses and homes in the local city of Ripon are liable to flood damage, and the resulting silt and sediment are putting the World Heritage property's heritage at risk. This flooding alternates with droughts, affecting the site's nature and heritage and – compounded by human activity – contributing to the spread of non-native invasive species. During the review of the World Heritage Site Management Plan in 2015 by the National Trust and local stakeholders, the steering committee recognized that to address these sustainable development challenges, it needed to work more closely with farmers and landowners upstream and seek the views and engagement of many of their communities to develop the Skell Valley Landscape Project. What followed was a huge stakeholder consultation by the World Heritage management team involving

active participation from schools, farmers, businesses and landowners. As the project developed, the number of partners grew. There are now 16 organizations in the Skell Valley partnership, including Harrogate and District Community Action, Ripon Museums Trust, representatives of the local farming community and local parish councils.

After five years of planning, consultation and surveys, the Skell Valley Landscape Project received £2.5 million (USD $3M) in funding from donors, including the UK National Lottery Heritage Fund and the European Regional Development Fund. The plan will pioneer innovative approaches to flood management and climate change with local partners. The four-year plan, which began in March 2021, comprises 15 projects grouped around four themes: the landscape is resilient; people are empowered; nature thrives; and heritage is celebrated (see Supplementary Information).[127]

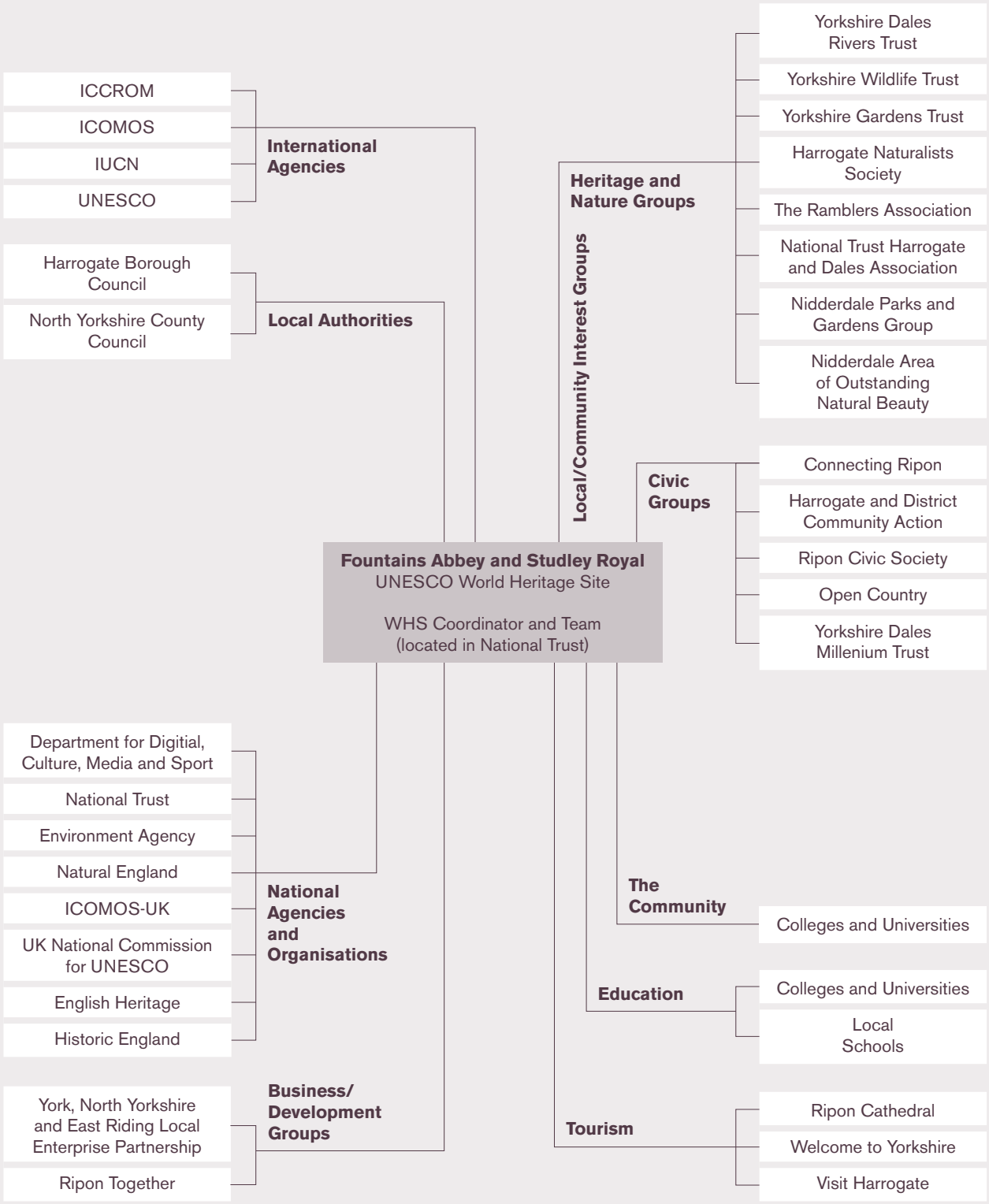
Despite this apparent success, the communities and stakeholders living in and around the World Heritage Site are not facing only climate change threats. Other sustainable development challenges include barriers to access to heritage and the outdoors, loneliness and isolation, health and well-being, a lack of diversity among the people who engage in volunteering, and the small size of the pool of volunteers. Sarah France, World Heritage Site Co-ordinator, explains:

**"We're one of the biggest attractions in Yorkshire, with 600,000 visitors a year. But we need to do more to reach out to people who struggle to access their local heritage, especially low-income families, people with disabilities and those who are elderly or isolated."**

Specific measures to help lower-income families engage with the area include free seeds, free access to gardening equipment, free transport to river sites for schools (as part of the "Watery Wildlife" project), river sampling equipment, and citizen science training.

Yorkshire Dales Rivers Trust learning about rivers community project, as part of the Skell Valley Project, UK / Anthony Chappel-Ross

**Figure 8. Numerous stakeholders are involved in the Fountains Abbey and Studley Royal World Heritage Site.**




At its heart is a partnership with the National Trust and Nidderdale Area of Outstanding Natural Beauty, the two areas that together make up the World Heritage Site area and are responsible for its outstanding cultural and natural heritage. Together, and with stakeholders, they can effectively address various sustainable development challenges.

The Skell Valley Landscape Project exemplifies the "sites for sustainable development" approach: the World Heritage Site management team plays a pivotal role through its broad, consensual working and participatory approach to helping local communities monitor and maintain their cultural and natural heritage and adapt to sustainable development challenges and evolving landscapes. The plan comprises multi-stakeholder partnerships and combinations of local, sub-national and national protected areas. The site co-ordinator convened key partners and stakeholders to identify critical components of the landscapes that require protection and management. Based on extensive consultation, the co-ordinators then developed a landscape-level management plan involving the community to create local solutions to mitigate threats, provide opportunities for local economic development, and address social elements of sustainable development.

The project has also had transnational implications: the World Heritage Site Management Team has exchanged knowledge with the global network of UNESCO designated sites. The Fountains Abbey and Studley Royal World Heritage Site co-operated with Rwenzori World Heritage Site in Uganda as part of the Melting Snow and Rivers in Flood[128] project funded by the UK's Cultural Protection Fund and Department for Digital, Culture, Media and Sport, the International National Trusts Organisation, and the Cross-Cultural Foundation of Uganda. In this project, the World Heritage team was able to share its natural flood management experiences with Rwenzori, while the Rwenzori team shared its experience in community engagement and understanding and mapping the importance of intangible heritage to local people. As well as highlighting the interweaving of natural, cultural and intangible heritage, the project emphasized the importance of being guided by the experience and needs of local communities.

Skell Project Uganda Visit, December 2021 / National Trust

# 4

# Sites for sustainable development in practice

## Highlights

- To determine the threats that are facing UK and Canadian UNESCO designated sites and threatening their capacities for sustainable development, the UK and Canadian National Commissions for UNESCO conducted a survey with site managers of all three designation types in the UK and Canada in 2020.

- The survey found that sites face a range of sustainable development threats. The threats most frequently identified in the UK and Canada were insufficient financial resources, the impacts of tourism, visitation and recreation, flooding, new housing developments, and storms.

- The survey data showed that site managers often lack the financial and human resources to work effectively with their stakeholders and communities to address these threats and, in turn, fulfill their roles as sites for sustainable development.

- A cluster analysis showed that different types of designated sites from different countries face similar threats. Further application of this novel methodology could assist UNESCO designated sites teams to identify other sites facing a similar range of threats, enabling them to share knowledge, pool resources and funding, and plan activities with local stakeholders to address sustainable development challenges.

Invasive/alien terrestrial species such as Himalayan Balsam (pictured), sand dune grasses, Japanese knotweed, as well as American Crayfish and grey squirrels, were identified by the majority of sites as widespread and damaging to local flora and fauna. Axe Valley, East Devon Area of Outstanding Natural Beauty, UK / Savo Ilic

In the previous sections, we have clearly laid out that UNESCO expects its designated sites to become model sites for sustainable development; we have also seen that UNESCO has established concrete frameworks (five attributes) that allow the designated sites to live up to this expectation along with frameworks to monitor their progress. However, it does not follow automatically that the designated sites will live up to that expectation even if they fulfil the requirements expressed in the five attributes.

In 2020, to determine sites' capacities to be sites for sustainable development, site managers of all three types of UNESCO designated sites in the UK and Canada were surveyed (see Supplementary Information) and their responses analyzed.
The goal was to assess sites' capacities to fulfil the role of sites for sustainable development (as outlined previously) and identify the common threats and challenges they faced. (The latter assessment is necessary because sustainable development represents itself through a particular lens and with a particular specificity in each of the world's geographical and social contexts.)

This survey and analysis:

- gathered information about sites' resources and determined their respective governance models
- identified both concrete sustainable development threats and management challenges by applying, for the first time, a common threat analysis to all three types of UNESCO site-based designations in two different countries
- assessed sites' capacities to monitor those threats (with a particular focus on the use of geospatial data), given that all the threats have spatial aspects

Based on the survey responses, several sites in Canada and the UK were also asked to provide case studies to yield further insight into their activities. Finally, an analysis of the results of UNESCO programmes' statutory reporting procedures for all three types of designated sites between 2016 and

2019 was conducted to determine whether the survey results were supported by trends in global reporting outcomes.

The survey questions were grouped into three sections:

- basic information about the site, such as geographical size and number of staff
- information about factors that currently threaten or negatively impact the site's designation
- the use of geospatial data

The list of threats used in this section of the survey is that adopted by the World Heritage Committee for its third cycle of periodic reporting (Figure 9). It was revised in 2017 to better integrate sustainable development approaches.[129]

According to this official World Heritage typology, there are 82 *specific threats* grouped into 13 *categories of threat.*[b] For example, within the "buildings and development" *category of threats,* there are five *specific threats*. Sites were asked to identify which *specific threats* they faced and to identify and rank the top three *specific threats* they think will pose the most significant challenges to their designation over the next 10 years. Sites also had the opportunity to add qualitative responses to questions. The full survey results are available upon request.

The survey and analysis then also grouped sites if they identified similar combinations of threats (possibly even similar "nexus" situations, irrespective of geographical location) in order to understand comparable approaches to addressing comparable threats, with a view to distilling a shared sustainable development agenda.

b Twelve categories relate to sustainable development threats the sites face, such as climate change and buildings and development, while one category focused on management threats – i.e., the designated sites' capacities to manage and deal with these threats from a management and governance perspective.

Loss of society's valuing of heritage, changes in traditional ways of life, the impacts of tourism, and decline of ritual, religious and spiritual uses were identified by many sites as threats. Peter Kiatainaq and his dogsled with Kangiqsujuaq (Canada) in the background / Robert Fréchette – Avataq Cultural Institute

**Figure 9. The list of threats in the survey was the same as that used by the World Heritage Committee for periodic reporting. There are 82 *specific threats* grouped into 13 *categories of threat*.**

| **Buildings and Development** | **Services Infrastructure** |
|---|---|
| Housing<br>Commercial Development<br>Industrial Areas<br>Major visitor accommodation and associated infrastructure<br>Interpretative and visitation facilities | Water infrastructure<br>Renewable energy facilities<br>Non-renewable energy facilities<br>Localised utilities<br>Major linear utilities |
| **Climate Change and Severe Weather Events** | **Management and Institutional Actors** |
| Storms<br>Flooding<br>Drought<br>Desertification<br>Changes to oceanic waters<br>Temperature change<br>Other climate change impacts | Management system/Management Plan<br>Legal Framework<br>Governance<br>Management activities<br>Financial resources<br>Human resources<br>Low impact research/monitoring activities<br>High impact research/monitoring activities |
| **Invasive/Alien Species or Hyper-abundant Species** | **Transportation Infrastructure** |
| Translocated species<br>Invasive/Alien terrestrial species<br>Invasive/Alien freshwater species<br>Invasive/Alien marine species<br>Hyper-abundant species<br>Modified genetic material | Ground transport infrastructure<br>Underground transport infrastructure<br>Air transport infrastructure<br>Marine transport infrastructure<br>Effects arising from use of transportation infrastructure |
| **Social/Cultural Uses of Heritage** | **Biological Resource Use/Modification** |
| Ritual/Spiritual/Religious and associative uses<br>Society's valuing of heritage<br>Indigenous hunting, gathering and collecting<br>Changes in traditional ways of life and knowledge system<br>Identity, social cohesion, changes in local population and community<br>Impacts of Tourism/Visitation/Recreation | Fishing/collecting aquatic resources<br>Aquaculture<br>Land Conversion<br>Livestock farming/grazing of domesticated animals<br>Crop production<br>Commercial wild plant collection<br>Subsistence wild plant collection<br>Commercial hunting<br>Subsistence hunting<br>Forestry/Wood production |
| **Local Conditions Affecting Physical Fabric** | **Sudden Ecological or Geological Events** |
| Wind<br>Relative humidity<br>Temperature<br>Radiation/Light<br>Dust<br>Water (Rain/Water table)<br>Pests<br>Micro-organisms | Volcanic eruption<br>Earthquake<br>Tsunami/Tidal wave<br>Avalanche/Landslide<br>Erosion and siltation/Deposition<br>Fire (wildfires) |
| **Pollution** | **Other Human Activities** |
| Pollution of marine waters<br>Ground water pollution<br>Surface water pollution<br>Air pollution<br>Solid waste<br>Input of excess energy | Illegal activities<br>Deliberate destruction of heritage<br>Military training<br>War<br>Terrorism<br>Civil unrest |
| **Physical Resource Extraction** | |
| Mining<br>Quarrying<br>Oil and gas<br>Water (extraction) | |

Forty-one sites out of a possible 90 responded as follows (figures in brackets indicate total number of sites in each category): Canadian biosphere reserves: nine (18); Canadian geoparks: two (five); Canadian World Heritage Sites: eight (20); UK biosphere reserves: three (seven); UK geoparks: four (eight); UK World Heritage Sites: 15 (32).

## 1. Human resources

The survey revealed that the number of staff per designated site ranges from zero (at one Canadian and three UK sites) to 250 (at the Rideau Canal UNESCO World Heritage Site[c]). Forty-nine per cent of sites across both countries have four or more full-time, paid staff.

The number of volunteers per designated site ranges from zero (at seven Canadian and three UK sites) to 800 (at Durham Castle and Cathedral UNESCO World Heritage Site). Eight UK designated sites have more than 50 volunteers (seven of these sites have 100+ volunteers). The engagement of volunteers at Canadian sites is generally lower: 52 per cent have fewer than 10. All sites have either staff or volunteers.

Forty-six per cent of sites have human resources assigned to maintaining a geographic information system (GIS) for the designation, while 12 per cent have no human resources assigned to maintaining a GIS. The remaining sites rely on partner organizations or consultancy to maintain GIS, either permanently or for one-off projects. See Section 2 of the Supplementary Information document for the breakdown of survey results.

## 2. Management and sustainable development threats

The survey identified that the top three *categories of threat* across all three designated sites in the UK and Canada relate to climate change and severe weather events; management and institutional actors; and social and cultural uses of heritage. Biological resource use/modification (including forestry/wood production and livestock farming/grazing) and buildings and development made up the next two biggest *categories of threat* (Figure 10).

c The Rideau Canal UNESCO World Heritage Site (Canada) employs many staff seasonally to operate the locks (from spring to autumn) and maintain the Rideau Canal Skateway (in winter).

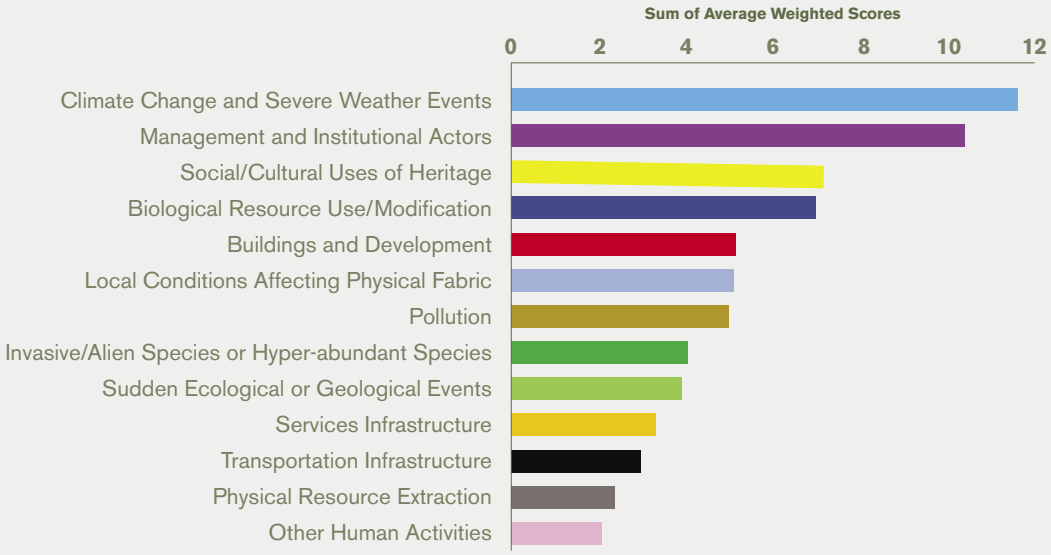
"Increased stormy weather prevents access to the site and can impact on our ability to manage. Increased frequency and intensity of storms causes more damage to buildings, increasing our costs but also impacting on how we repair. We need to repair roofs every year and have occasional localised flood damage to some buildings. Conversely we also have longer periods with no rain, this shrinks the ground and can contribute to buildings collapsing."

**World Heritage Site, UK**

"Drought impacts sustainable farming; flooding causes significant damage to natural features; and, severe weather impacts human health and safety, the health of ecosystems, and food security."

**Biosphere Reserve, Canada**

**Figure 10. The top three *categories of threat* identified by 41 UNESCO designated sites in the UK and Canada are climate change and severe weather events; management and institutional actors; and social and cultural uses of heritage.**




The Chi Winder/Chi Vesta facility is a new build within the Cornwall and West Devon Mining Landscape UNESCO World Heritage Site, UK. The building has been constructed to provide temporary accommodation for homeless people within the Redruth and Camborne area. The build works to maintain the OUV of the site, through well-considered use of materials, while its function delivers significant benefits in terms of fostering social inclusion in an area of multiple deprivation. / Ainsley Cocks

Ding Done Mine, Cornwall and West Devon Mining Landscape UNESCO World Heritage Site, UK / Barry Gamble

## Case study 3: Cornwall and West Devon Mining Landscape World Heritage Site, UK

The largest industrial World Heritage Site in the UK is set to serve as a significant driver for economic regeneration, social equity and sustainable development. Granted UNESCO World Heritage status in 2006, the Cornwall and West Devon Mining Landscape site spans more than 19,000 hectares across Cornwall and into the neighbouring county of Devon.

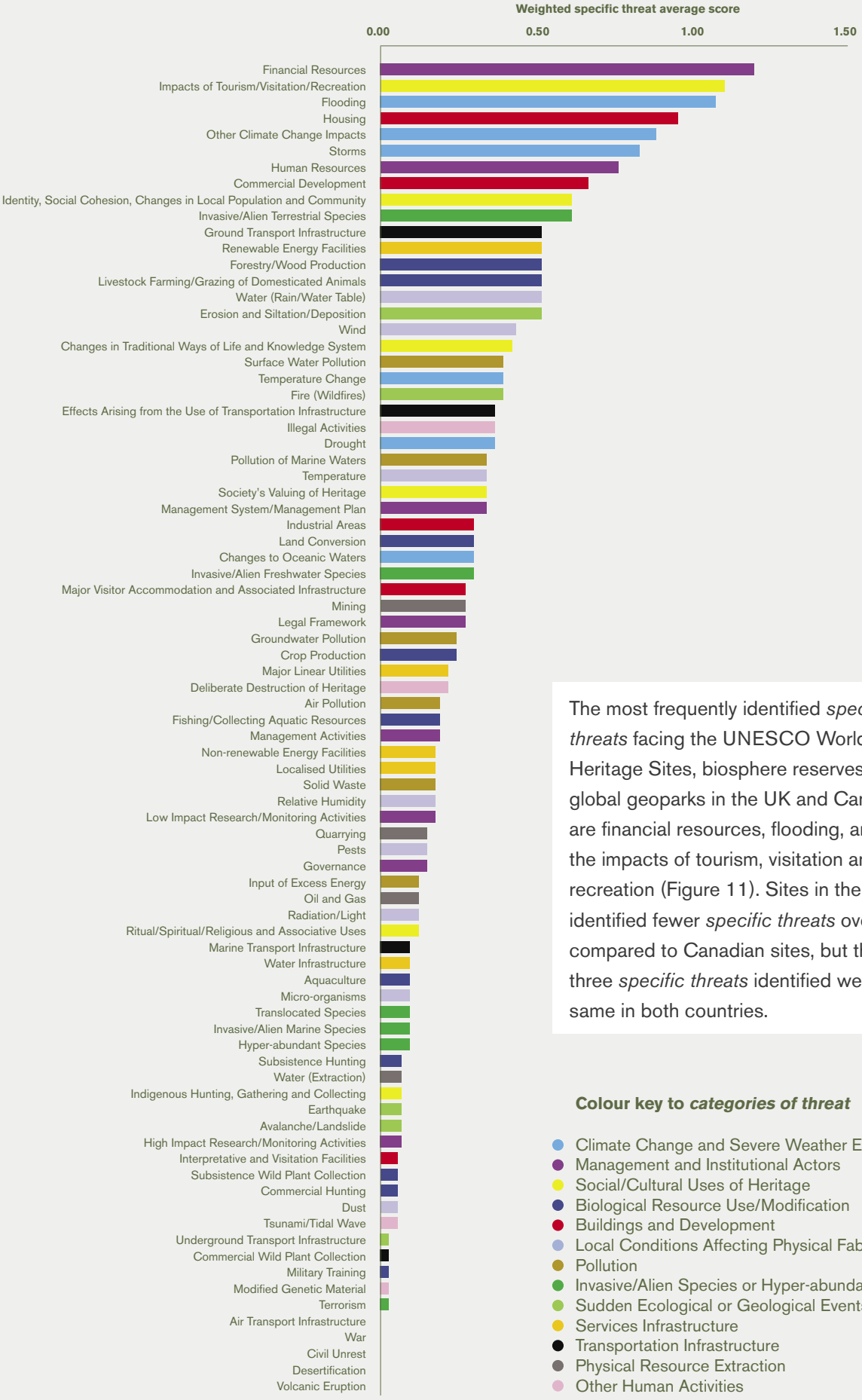
Following widespread consultation, the UNESCO designated site coordination team in Cornwall Council recast its management plan within the frame of climate change. "All councils in Cornwall have declared a climate emergency, and climate-related threats are the number one challenge for the World Heritage Site," explains World Heritage Site co-ordinator Deborah Boden. "We decided, when it was time to review the management plan, to use the UN SDGs as our foundation."

With an emphasis on social equity, climate resilience and international partnerships, the site is looking at a programme of research on climate-related issues, responding to the area's geological and biological diversity. The aim is to continue to protect the different areas of the World Heritage Site from the impacts of climate change while also undertaking research and activities to mitigate its effects.

"There are exciting opportunities," says Boden. "We have the potential to generate geothermal energy, and we are one of the few areas in Europe with access to lithium – one of the metals that could be key to a low-carbon future." Many other UK sites are keen to learn from Cornwall's process and plans, which provide forward-looking examples of how UNESCO designated sites can respond to climate change and forge solutions.

"We've been thrilled by the reaction of the public. There's really strong support for our plans and an understanding that this is something we must do – for the future of the World Heritage Site and our local communities," adds Boden. "Governments worldwide, including the UK, have committed to the SDGs and climate targets. World Heritage Sites have a role to play in helping to make those targets a reality."

**Figure 11. This chart depicts the full hierarchy of *specific threats*, colour-coded by the 13 *categories of threat*. Of the 82 possible *specific threats* included in the survey, only six (air/transport infrastructure, war, civil unrest, terrorism, desertification and volcanic eruption) are not an issue for any site in either Canada or the UK.**




The most frequently identified *specific threats* facing the UNESCO World Heritage Sites, biosphere reserves and global geoparks in the UK and Canada are financial resources, flooding, and the impacts of tourism, visitation and recreation (Figure 11). Sites in the UK identified fewer *specific threats* overall compared to Canadian sites, but the top three *specific threats* identified were the same in both countries.

**Colour key to *categories of threat***

- Climate Change and Severe Weather Events
- Management and Institutional Actors
- Social/Cultural Uses of Heritage
- Biological Resource Use/Modification
- Buildings and Development
- Local Conditions Affecting Physical Fabric
- Pollution
- Invasive/Alien Species or Hyper-abundant Species
- Sudden Ecological or Geological Events
- Services Infrastructure
- Transportation Infrastructure
- Physical Resource Extraction
- Other Human Activities

Mount Arrowsmith UNESCO Biosphere Region, Canada / Mount Arrowsmith Biosphere Region Research Institute

## Case study 4: Mount Arrowsmith Biosphere Region, British Columbia, Canada

Mount Arrowsmith UNESCO Biosphere Region (MABR) covers approximately 1,200 km$^2$ of the east coast of Vancouver Island. Designated a biosphere reserve in 2000, MABR is home to around 58,000 residents and lies within the traditional territories of seven First Nations communities.

Like other Canadian Biosphere Regions, Mount Arrowsmith is constantly battling invasive alien and hyper-abundant species.

"Invasive species have become a huge concern and a threat to biodiversity, as they often out-compete native species," explains Mandy Hobkirk, co-ordinator for the reserve. Many flora and fauna rely heavily on native species for food and habitat. Invasive species generally grow and expand their range very quickly, closing any gaps where native flora and fauna could thrive. Some invasive species have no established predators, resulting in little to no natural management of their populations.

MABR is engaged in a number of projects and initiatives to battle invasive species, but is limited by funding in what it can do. Much of the work is carried out by volunteers and concerned residents. For example, volunteers collaborate with the British Columbia Marine Trails and British Columbia Parks to remove invasive plants on Gerald Island, a provincial park located within the biosphere region. "Their involvement is essential," says Hobkirk. "But tackling invasive species takes time, effort and resources away from other valuable projects we could pursue."

Many projects involve Mount Arrowsmith Biosphere Region Research Institute volunteers. The institute was established by Vancouver Island University and currently funds the co-ordinator post.

**"Establishing the institute in 2014 meant we could develop a collaborative approach, connecting the expertise and capacity of students and researchers from the university with the community to help establish and deliver the priorities for the region," Hobkirk explains.**

The staff receive guidance and direction from a roundtable of regional representatives from local First Nations (Snaw-naw-as, Qualicum and Snuneymuxw), local and senior levels of government, Vancouver Island University, conservation organizations, the forestry industry, local businesses and an elected community representative.

**"The capacity of our biosphere reserve and the number of projects we can implement is based on the amount of funding we can bring in," says Hobkirk. "We rely on secured funds to purchase equipment to conduct research, pay for travel to research sites, and provide compensation for experts in the field who contribute to activities and analysis."**

Fieldwork in the Biosphere / Mount Arrowsmith Biosphere Region Research Institute

Sites in both countries identified insufficient financial resources as the most significant *specific threat;* flooding was the next most significant threat for Canada, but third for the UK. Other differences in the relative importance of the other *specific threats* are likely to be related to economic, social, environmental and cultural differences between the countries. For example, forestry/wood production was rated as the sixth most important *specific threat* in Canada compared to 26th in the UK; effects arising from the use of transportation infrastructure ranked much higher in the UK than in Canada.

"Logging in Old Growth Rainforest areas continues to be a threat."

**Biosphere Reserve, Canada**

"Historic buildings suffer persistent external damage from particulate pollution largely from exhausts of lorries and buses."

**World Heritage Site, UK**

In March 2019, Bath and North East Somerset Council (UK), which has the City of Bath UNESCO World Heritage site in its boundary, declared a climate emergency. Its Climate Emergency declaration and action plan aims to make the area Carbon Neutral by 2030, by making buildings more environmentally friendly, enabling more sustainable transport, and increasing local renewable energy generation. / Max Maximov

Memorial Church in Grand-Pré National Historic Site, Nova Scotia, Canada / Wangkun Jia

## Case study 5: Landscape of Grand Pré World Heritage Site, Nova Scotia, Canada

Bearing exceptional testimony to the traditional farming methods of the Acadians and serving as a unique place of remembrance and cultural significance, the Landscape of Grand Pré World Heritage Site is part of a 241 kilometre stretch of dykeland along Canada's Bay of Fundy. Its system of dykes, aboiteaux (sluice gates) and drainage, created in the 17th century, is threatened by flooding from both east and west.

The Landscape of Grand Pré is at the centre of a multi-million dollar programme to protect the surrounding area from flooding caused by climate change and rising sea levels. The eight-year project, which started in 2019, is being funded by the provincial and federal government through the Disaster Mitigation and Adaptation Fund. The work might include reinforcing and increasing the height of the dykes; realigning the dykes by moving them inland or altering their course to help prevent erosion; restoring tidal wetlands; restoring and replacing aboiteaux; and improving drainage by ditching and dredging.

Claude de Grâce, executive director at Landscape of Grand Pré, says upgrading the dykes and protecting this resource from flooding, storms and the effects of climate change are essential tasks. "The dyke lands here are still immensely fertile and 100 per cent farmed. We are a tourist site, a place of pilgrimage and a vibrant local community and economy."

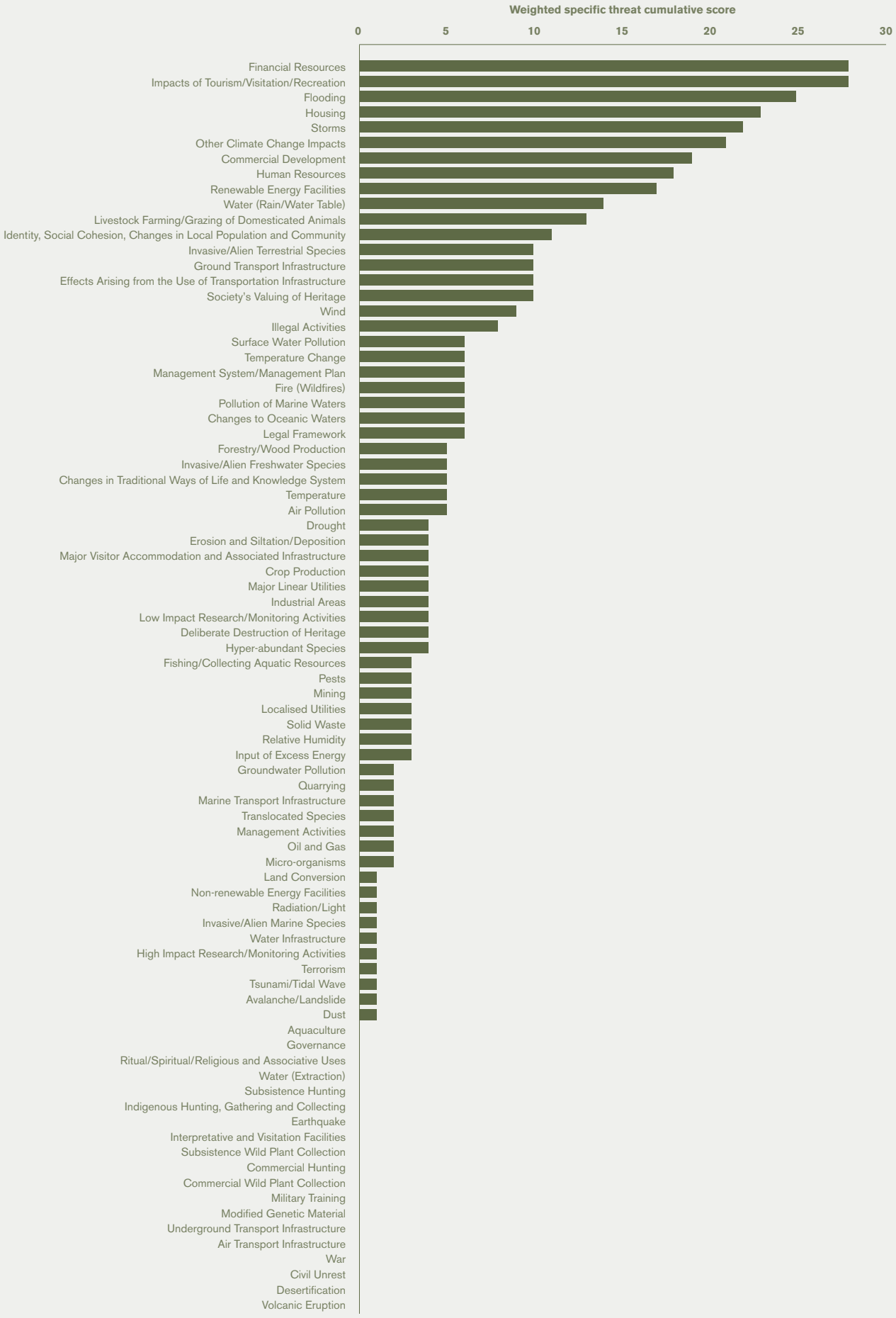
The upgrade project involves consultation with a wide range of stakeholders including landowners and Mi'kmaq communities, he adds. "These are the most significant upgrades since the middle of the last century but the impact of climate change means we have to take action."

The lands have evolved over time, with farmers introducing vineyards, and they are as important to farmers today as they were to the Acadians in the 17th century. "Part of our aim going forward," says de Grâce, "is to ensure that the full story of this landscape and all its people continues to be told and celebrated."

An Acadian himself, de Grâce has been involved with Landscape of Grand Pré since the early 1980s and understands its huge cultural significance. "This land and the history of the Acadians attract tens of thousands of visitors a year," he says. "Our recognition as a site of global value by UNESCO was undoubtedly influential in helping to attract the funding to make us more resilient to climate change."

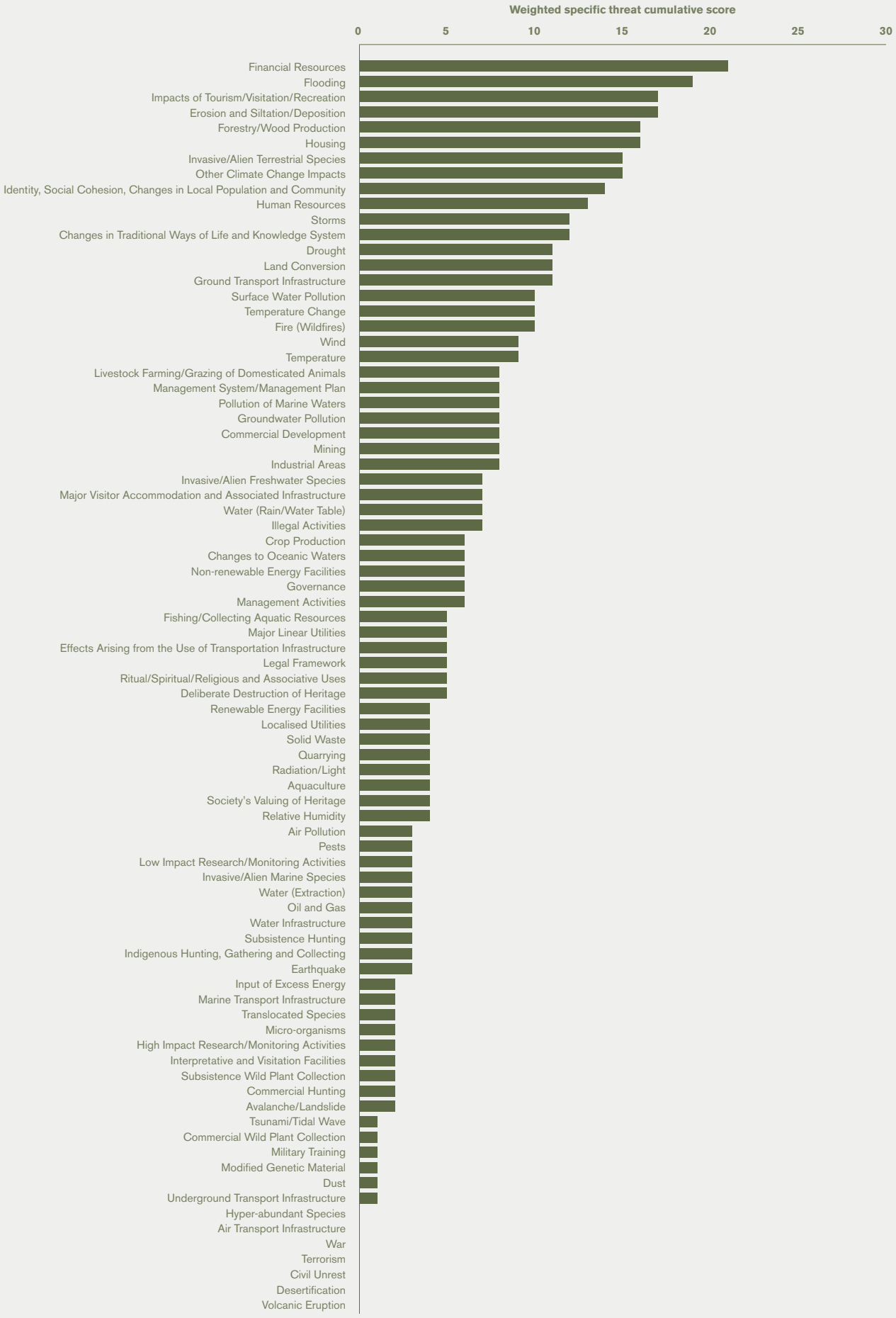
## Figure 12. Canada and UK designated sites face similar specific threats but rank their significances differently.

### Designations in the UK



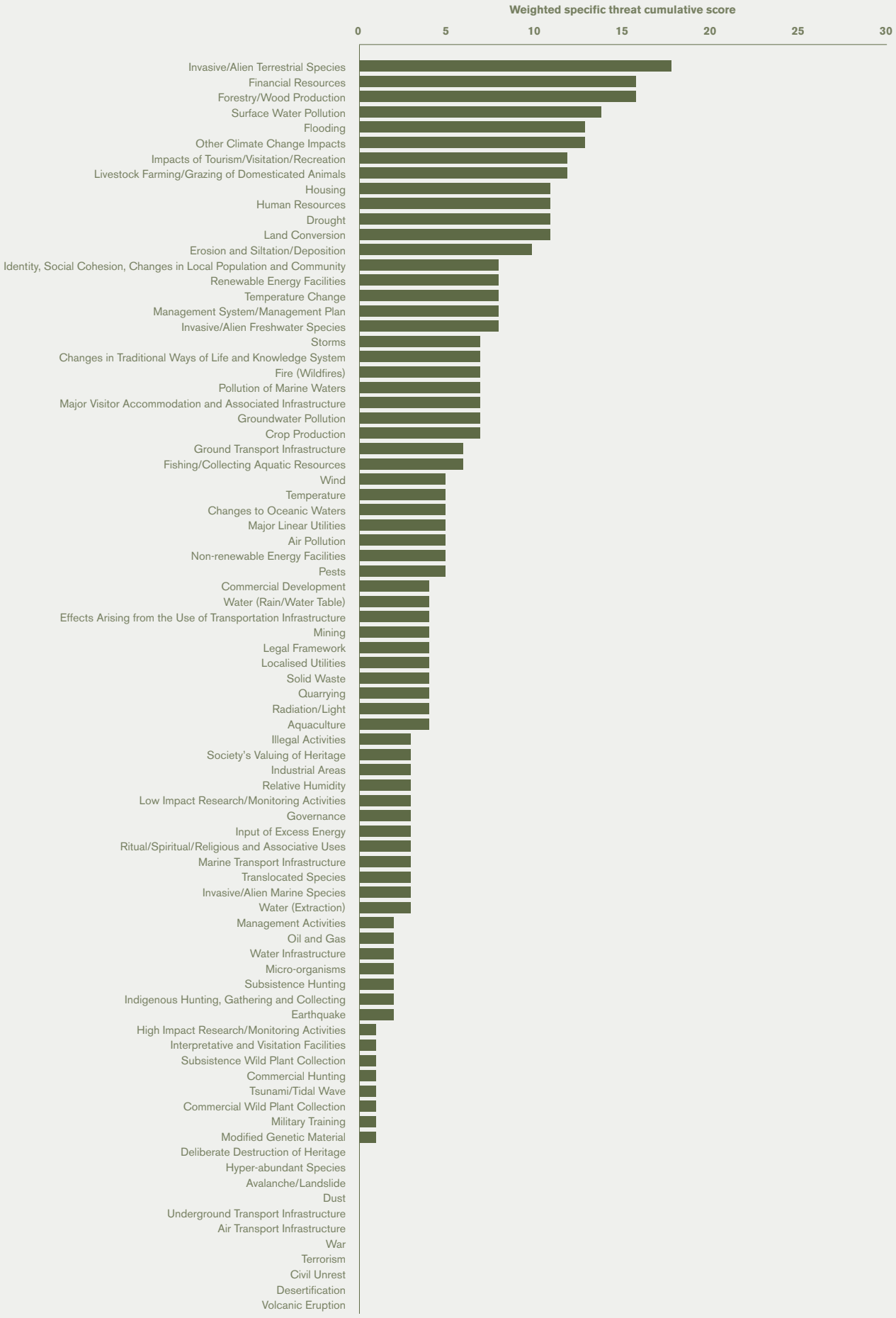
## Figure 12. Canada and UK designated sites face similar specific threats but rank their significances differently.

### Designations in Canada



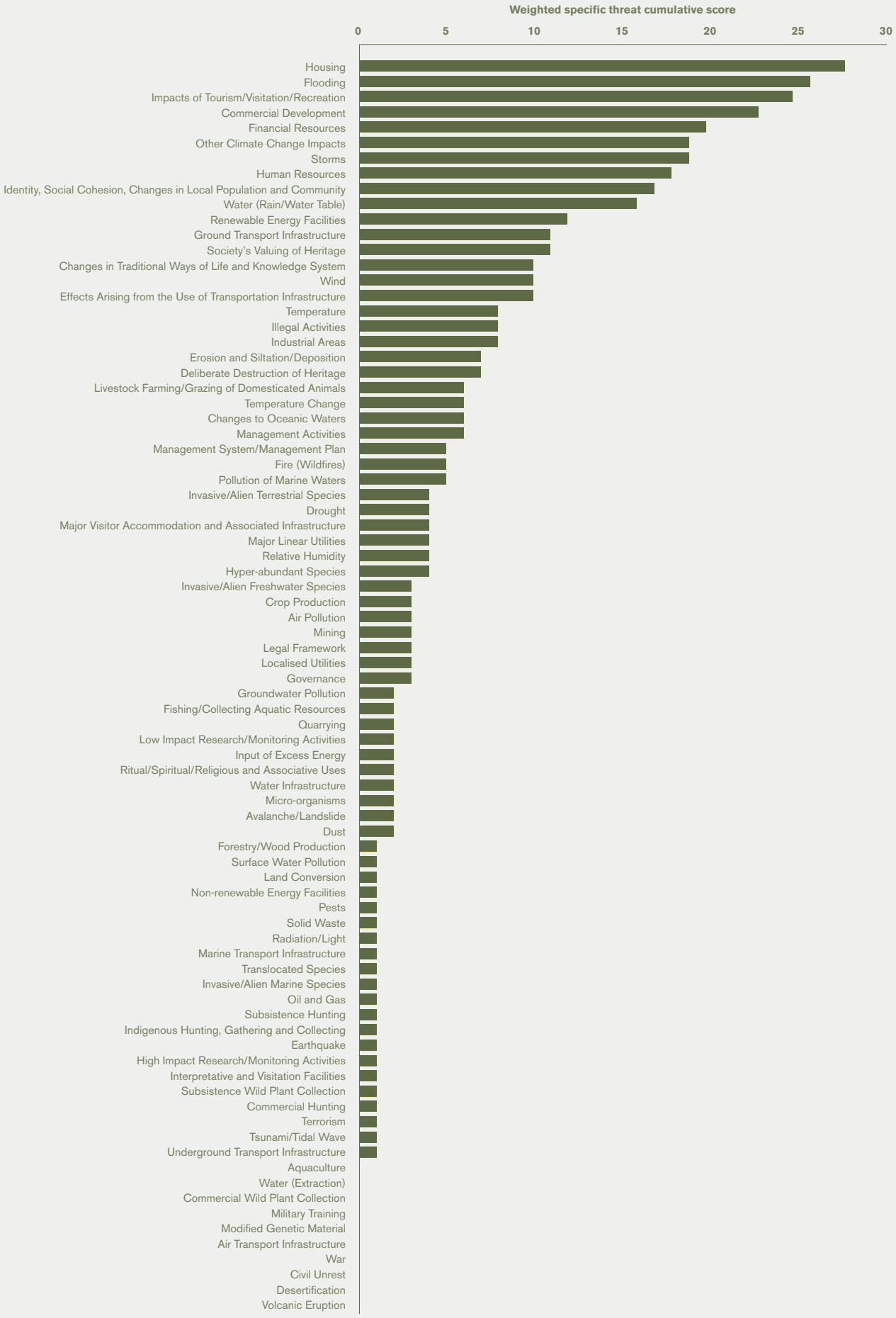
## Figure 13. Different types of designated sites rank *specific threats* differently.

### Biosphere Reserves



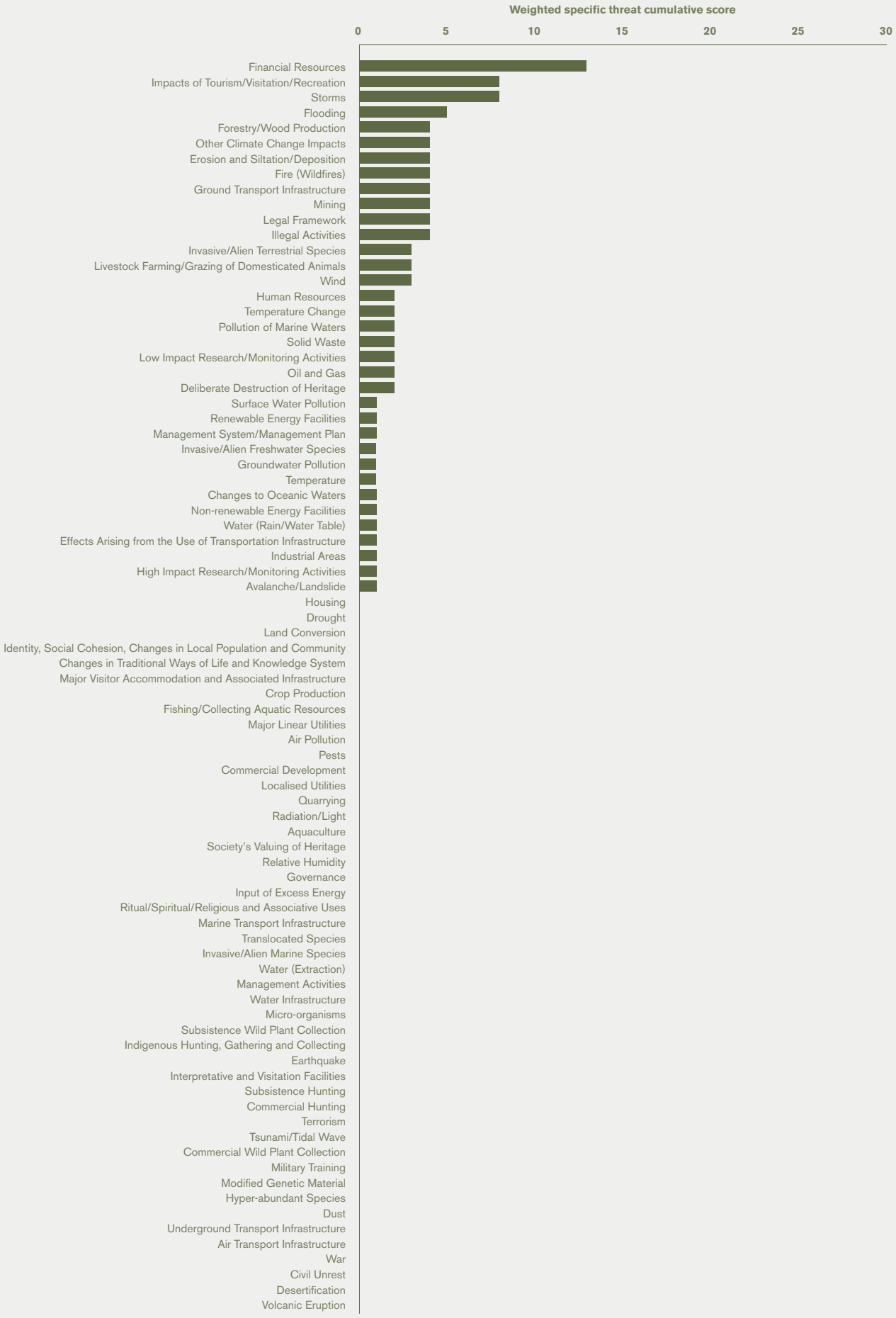
## Figure 13. Different types of designated sites rank specific threats differently.

### World Heritage Sites



## Figure 13. Different types of designated sites rank specific threats differently.

### Global Geoparks



There were several differences in the top three *specific threats* by designation type (Figure 13 and Table 7).

Geoparks experienced fewer *specific threats* overall compared to both biosphere reserves and World Heritage Sites.

### Table 7. The top three threats by designation type

| Biosphere reserve | Global geopark | World Heritage Site |
|---|---|---|
| 1. Invasive/alien species | 1. Financial resources | 1. Housing |
| 2. Financial resources | 2. Impacts of tourism, visitation and recreation | 2. Flooding |
| 3. Forestry/wood production | 3. Storms | 3. Impacts of tourism, visitation and recreation |

The red squirrel is officially classed as Near Threatened in England, Wales and Northern Ireland, but is locally common in Scotland. Red squirrel, Galloway and Southern Ayrshire UNESCO Biosphere Reserve, UK / Daniel / Adobe Stock

"Invasive terrestrial species have become a huge concern and efforts for removal are consistent. Similarly in freshwater lakes, wetlands, and ponds, Eurasian milfoil is the most common, and very hard to remove."

**Biosphere Reserve, Canada**

"A variety of protected or native species within our geopark that are threatened by invasive species, include red squirrels *(Sciurus vulgaris)*, white-clawed crayfish *(Austropotamobius pallipes)*, earthworms *(Lumbricus terrestris)* and now the freshwater pearl mussel *(Margaritifera margaritifera)* with the recent introduction of the Asian clam *(Corbicula fluminea)*."

**Global geopark, UK**

"More intense storms noticed in recent years; impact is in the form of coastal erosion."

**World Heritage Site, Canada**

Titanic Rock, Tumbler Ridge UNESCO Global Geopark, Canada / Jesaja Class

## Case study 6: Tumbler Ridge Geopark, British Columbia, Canada

Designated a UNESCO global geopark in 2015, Tumbler Ridge spans 8,478 km$^2$ of the northern Rocky Mountains in the Province of British Columbia. Covering a geologic time range from 730 to 55 million years ago, the geopark's highest peak is 2,630 metres above sea level. The geopark features dinosaur tracks from the Cretaceous period (many of which are of global significance), a dinosaur bone bed from the same period, and an abundance of fish and marine reptile fossils from the Triassic period.

Mining is one of the biggest threats to the geopark. The geopark seeks to work with mining companies to avoid potential damage and ensure that any potentially significant finds are documented. "Coal extraction is the main industry in the area," explains Manda Maggs, Executive Director. "The local mining companies have an agreement with the local museum that they will document any fossils of significance (usually dinosaur trackways) and inform them. In the past, depending on the site manager, they have actually assisted with preservation by working with staff paleontologists to extract significant finds and relocate them to the museum."

The Ministry of Environment for the local authority also keeps the geopark informed of permit applications that may affect the area.

In the survey, the *specific threat* of "identity, social cohesion, changes in local population and community" was identified by 32 per cent of sites. This threat could create challenges when it comes to the development of multi-stakeholder partnerships. Indeed, social/cultural use of heritage placed in the top three *categories of threats* across all designations. Qualitative responses to this threat included concerns about declining populations in rural areas affecting biosphere reserves' abilities to engage local communities. World Heritage Site managers were particularly concerned about the lack of understanding among communities of the significance of Outstanding Universal Value. Clearly, the challenges related to financial resources identified above will have significant impact on sites' abilities to engage with local communities, develop partnerships and perform outreach activities.

Tumbler Ridge Museum 2021, British Columbia, Canada / Jesaja Class

Waterton Biosphere Reserve, Canada / Circumnavigation

## Case study 7: Waterton Biosphere Reserve, Alberta, Canada

Waterton Biosphere Reserve occupies a uniquely beautiful position in the extreme southwest of the Province of Alberta, Canada. Its stunning interface of rocky mountain peaks and prairie grasslands are at the heart of the Crown of the Continent Ecosystem, an area internationally acclaimed as one of the largest remaining intact ecosystems in North America.

Kelly Cooley, a specialist consultant in agricultural and environmental management, is working with residents, specialists and public bodies to monitor and manage invasive species, which pose one of the biggest threats to the biosphere.

"Invasive species issues are complicated by multi-jurisdictional complexity and competing values in terms of land and water use patterns, many of which overlap and are cumulative," she says. "Agricultural, industrial, commercial, recreational and residential uses have allowed invasive species to be introduced and spread in most parts of the biosphere, despite the best efforts of various area invasive species management programmes."

Natural hazards have also played their part in the spread. The Kenow-Waterton wildfire of 2017 ravaged the reserve and national park, incinerating and opening up much of the landscape. "The burned areas are recovering in remarkable ways, but it's been a struggle for some native vegetation to compete with the invasive species which were present prior to the fire," explains Cooley. There's also a fear that the spread of certain species, such as cheatgrass, could make wildfires more frequent and extensive.

Particular projects include the South West Invasive Managers Partnership, the Crown Terrestrial Invasive Plant Network (CTIPN), and the Southern Alberta Weed Co-ordinator Partnership.

"There is a lot of positive collaboration," says Kelly. Waterton's position at the southwest corner of Alberta, close to the Province of British Columbia border in Canada to the east and the State of Montana border in the US to the south, has enabled the biosphere to benefit from successful collaborations between the provinces and states. These have included two trans-boundary tours that brought together key managers and political decision-makers from all levels of government to showcase what was going well and what presented challenges to stewardship of land and water. Looking ahead, funding remains a challenge, particularly in the aftermath of the pandemic.

## 3. Grouping sites by threat: A model for collaboration

A cluster analysis was applied to the survey data (see Section 2 of the Supplementary Information document for information about this method) to identify groups of designated sites that face similar combinations of threats.[130] By applying this analysis to all the designated sites in this study and using the data from the evaluation of threats from the questionnaire, it was possible to identify four major clusters (Figure 14):

- Cluster 1 sites (see Box 8) tend to face mainly environmental threats (particularly flooding, storms and erosion/siltation processes), sometimes because of their coastal locations.
- Cluster 2 sites face threats associated with human agency (such as human and financial resourcing challenges, illegal activities, and deliberate destruction of heritage), as reflected in the intercultural context of many of these sites.
- Cluster 3 sites are preoccupied by issues associated with housing and also face threats linked to pollution. The impacts of tourism constitute little or no threat to these sites.
- Cluster 4 sites have identified commercial development and other threats associated with climate change along with the impacts of tourism, visitation and recreation as threats. This situation reflects the nature of many of these sites as popular city centres or "beauty spots."

Volunteers cleaning up after flooding at Derwent Valley UNESCO World Heritage Site, UK / Derwent Valley Mills WHS Partnership

**Figure 14. The cluster analysis grouped the designated sites from different countries according to the threats they identified in the survey. (See Section 2 of the Supplementary Information document for analysis details.)**

| Cluster 1 |
|---|
| Flooding |
| Storms |
| Erosion and Siltation/Deposition |
| Forestry/Wood Production |
| Livestock Farming/Grazing of Domesticated Animals |
| Human Resources |
| Housing |
| Management Activities |
| |
| Biosphere Dyfi (UK) |
| Cliffs of Fundy (CAN) |
| Frontiers of the Roman Empire – Hadrian's Wall (UK) |
| Galloway and Southern Ayrshire (UK) |
| Landscape of Grand Pré (CAN) |
| L'Anse aux Meadows National Historic Site (CAN) |
| Manicouagan-Uapishka (CAN) |
| Marble Arch Caves (UK) |
| Red Bay Basque Whaling Station (CAN |
| St Kilda (UK) |
| The English Lake District (UK) |
| Tumbler Ridge (CAN) |

| Cluster 2 |
|---|
| Financial Resources |
| Changes in Traditional Ways of Life & Knowledge System |
| Human Resources |
| Illegal Activities |
| Deliberate Destruction of Heritage |
| Impacts of Tourism/Visitation/ Recreation |
| Hyper-abundant Species |
| Other Climate Change Impacts |
| Air Pollution |
| Forestry/Wood Production |
| |
| Blaenavon Industrial Landscape (UK) |
| Fforest Fawr (UK) |
| GeoMôn |
| Mont Saint-Hilaire (CAN) |
| North West Highlands (UK) |
| Pimachiowin Aki (CAN) |
| Pontcysyllte Aqueduct and Canal (UK) |
| Redberry Lake (CAN) |
| Rideau Canal (CAN) |
| Writing-on-Stone/Áísínai'pi (CAN) |

| Cluster 3 |
|---|
| Housing |
| Society's Valuing of Heritage |
| Surface Water Pollution |
| Groundwater Pollution |
| Invasive/Alien Terrestrial Species |
| Management System/Management Plan |
| Impacts of Tourism/Visitation/Recreation |
| |
| Beaver Hills (CAN) |
| Derwent Valley Mills (UK) |
| Frontiers of the Roman Empire – Antonine Wall (UK) |
| Maritime Greenwich (UK) |
| Mount Arrowsmith (CAN) |
| Old Town Lunenburg (CAN) |
| The Forth Bridge (UK) |
| Waterton (CAN) |

| Cluster 4 |
|---|
| Commercial Development |
| Other Climate Change Impacts |
| Impacts of Tourism/Visitation/Recreation |
| Visitor Accommodation & Associated Infrastructure |
| Renewable Energy Facilities |
| Water (Rain/Water Table) |
| Oil and gas |
| |
| Castles and Town Walls of King Edward in Gwynedd (UK) |
| Clayoquot Sound (CAN) |
| Cornwall and West Devon Mining Landscape (UK) |
| Dorset and East Devon Coast (UK) |
| Durham Castle and Cathedral (UK) |
| Heart of Neolithic Orkney (UK) |
| Kluane/Wrangell-St Elias/Glacier Bay/ Tatshenshini-Alsek (CAN) |
| Niagara Escarpment (CAN) |
| North Devon (UK) |
| Old and New Towns of Edinburgh (UK) |
| Southwest Nova (CAN) |

| Cluster Threat Level |
|---|
| High |
| Moderate |
| Low |

| Designation Type |
|---|
| Biosphere Reserve |
| Global Geopark |
| World Heritage Site |

## Box 8: Exploring common strategies

The Landscape of Grand Pré World Heritage Site and English Lake District World Heritage Site (cluster 1) were the only sites that identified flooding as their most significant threat. Both site managers volunteered more information about the nature of flooding as a threat in a comment box on the survey:

**"The most significant threats to the cultural resources related to the Outstanding Universal Value of the Landscape of Grand Pré are related to the rise of sea levels and storm surges related to climate change."**
Landscape of Grand Pré

**"Increase in storm intensity and rainfall leading to flooding in winter and more drought events in summer."**
English Lake District

Site managers at Fforest Fawr Geopark and Mont Saint-Hilaire Biosphere Reserve (cluster 3) both identified financial resources as their most significant threat. At Fforest Fawr, staff stated that, looking forward, "budget pressures are expected to increase, leading to reduced performance (across the UK public sector)," while at Mont Saint-Hilaire, staff agreed that "[t]here is no statutory funding for the biosphere, and it takes a lot of effort to keep team members" (translation from French).

Both sites identified the impacts of tourism, visitation and recreation as the second- and third-most significant threats, respectively. Staff at Fforest Fawr reported that "[t]oo many visitors in certain areas and at certain times impact on quality of resources and quality of life for local residents." Mont Saint-Hilaire staff said that more than 300,000 people a year visit the natural site of about 10 $km^2$.

Trail construction at Mont Saint-Hilaire Biosphere Reserve, Canada / Centre de la Nature Mont Saint-Hilaire

The analysis demonstrates that the clusters of designated sites have more in common in terms of the *specific threats* they face than in terms of their location or designation type. These results could provide a basis for these groups to explore common strategies for mitigating *specific threats* and sharing best practices for implementing specific measures.

## 4. Monitoring capacity

UNESCO designated sites are invited (and often, required) to perform both regular and one-off monitoring activities. These include monitoring meteorological data and animal and plant species inventories and capturing socio-economic data, such as visitor counts. The monitoring needs of cultural and natural heritage sites vary significantly. However, there is one monitoring approach that is sensible and necessary for all: the use of remote sensing data – most importantly, GIS tools.

As discussed above, monitoring and reporting processes require data. The survey asked site managers to identify what GIS information their sites had access to for monitoring the sustainable development threats they faced. The results revealed that 38 out of the 41 respondents used GIS tools to manage their sites, with only three indicating that they did not. Of those that used GIS tools, 25 stated that they maintained a GIS internally, and 13 stated that the GIS was maintained externally. When asked what GIS software they used, the vast majority indicated that Esri's ArcGIS was their tool of choice. Several reported using QGIS. About 25 per cent said they used other tools. When asked about the frequency of usage, just 14 sites indicated that they used GIS tools daily or weekly, with more saying they used these either irregularly or rarely. GIS was most frequently used for spatial analysis (such as for designation report, review and revalidation) followed by conservation monitoring. It was used infrequently for visitor management and predictive modelling.

The top three categories of existing geospatial data held by the designated sites that took part in the survey were natural and cultural heritage conservation, administrative boundaries, and accessibility and transport. The least well covered categories of existing datasets were events, partnerships, and educational or training facilities and activities. Relatively few sites reported keeping information that we would describe as less tangible in terms of traditional GIS usage; for example, categories such as tourism and industry featured in just half of the sites surveyed. However, in contrast, many sites do hold data on natural and cultural heritage. These data support actions to monitor the highly ranked threat of social and cultural uses of heritage.

Two invasive species have struck different parts of the province of Nova Scotia in Canada: the MSX parasite found in oysters on the Bras d'Or Lakes, and the green crab in Southwest Nova. To defend themselves against such threats, communities in these two regions came together to seek designation as UNESCO Biosphere Reserves, which promote solutions reconciling the conservation of biodiversity with its sustainable use. / Catherine Bernier

Sycamore Gap and Robin Hood's tree on Hadrian's Wall, UK / Alexandra / Adobe Stock

## Case study 8: Hadrian's Wall Community Archaeology Project, northern England

Dr. Rob Collins, a lecturer at Newcastle University, is fulfilling a 10-year dream. He is the project manager for WallCAP, a three-year community archaeology and research programme designed to improve the heritage of Hadrian's Wall UNESCO World Heritage Site. Stretching 130 kilometres east to west across northern England, Hadrian's Wall is part of the Transnational Frontiers of the Roman Empire UNESCO World Heritage Site, which includes the Antonine Wall in central Scotland as well as the Upper German-Rhaetian Limes, a 550 kilometre section of the former external frontier of the Roman Empire between the Rhine and Danube rivers.

Recent concerns have indicated that much-needed conservation projects are hampered by a lack of centralized knowledge – a situation exacerbated by the fact that the monument has some 700 stakeholders, including seven planning authorities. WallCAP is hoping to help address this. "A central plank of our project is to develop a GIS," explains Dr. Collins. "For the first time, we'll have essential data about the Wall at our fingertips. As well as helping with future research, this will make management easier and more effective and help us to respond to threats and future challenges."

The data for the GIS are being gathered by a team of active volunteers. Kerry Shaw, volunteer co-ordinator for Hadrian's Wall, says the response from volunteers has been inspirational. "We use a portal on our website to recruit volunteers, and the idea of researching for the GIS has really galvanized people. We've seen people who were less active previously become engaged, and we have recruited a wider demographic."

The COVID-19 pandemic meant the project had to be adapted so volunteers could take part via desk-based research. The project team ran drop-in Zoom sessions at which volunteers could raise questions, and final data were submitted online using standardized forms.

A key challenge for WallCAP, which is funded by the National Lottery Heritage Fund, is how to ensure the GIS remains up to date and is used successfully to help manage the Wall in the future.

John Scott, World Heritage Site co-ordinator for Hadrian's Wall, understands this challenge well. "At its simplest, a GIS helps us to understand our space. Before this project, we had reams of data about the Wall, but they were held in hundreds of different places and some of the data were inaccessible. We'll now have accessible data in one place, but we need to communicate its value and get the right people adding to it and making use of it."

Kathryn Murphy, project support officer for WallCAP, has been tasked with much of the data verification work and with populating the GIS. "Capacity and long-term legacy are vital considerations when setting up a GIS," she explains. "It mustn't become static, and we need to make sure this GIS continues to develop and deliver its potential at the end of this project."

The GIS has been designed so that new datasets can be added over time and will be publicly available at the end of the project. "I hope we're succeeding in breaking some of the myths around GIS," adds Scott.

**"We've witnessed how developing a GIS can add so much value and bring people and partners together. It serves as a unifying tool and has widened participation."**

Dr. Rob Collins with WallCAP volunteers / Ian Wylie

In total, the respondents detailed more than 20 independent types of data sources, or locations from which data are obtained, to support their GIS activities (see Section 2 of the Supplementary Information document). These included official government sources, national mapping agencies (such as Ordnance Survey[131] in Great Britain), non-governmental organizations, academia (including local schools) and even original paper maps and other paper sources. Many of the sites responded that they also generate a large amount of data themselves, relying on site managers and volunteers for collection.


Miranda Frison, David Colville and David Mclean presenting the Nova Scotia Interactive Science Atlas / Southwest Nova Biosphere Reserve Association

## Case study 9: The Southwest Nova Interactive Science Atlas, Nova Scotia, Canada

The Southwest Nova Biosphere Reserve Association has partnered with the Nova Scotia Centre of Geographic Sciences and the Government of Nova Scotia to develop a unique software application to increase access to ecological data for students, educators, land managers and the general public.

The biosphere reserve recognized that to support actions that align with the needs of the biosphere region, residents and businesses required the ability to explore and access high-quality and current information about the region and to be able to communicate and share decisions based on these data. This led to the development of the biosphere reserve's platform, the Nova Scotia Interactive Science Atlas.

The science atlas contains 12 chapters relating to issues such as climate, biodiversity, culture and history, and agriculture. It aims to encourage institutional use of standardized information management protocols, use a hierarchical ecological framework to link with GIS spatial and temporal data, and facilitate multi-variate statistical analysis for stressor impact assessment, research hypothesis development, resource use planning, modelling, gap analysis and student education.

The survey responses indicate a wide range of understanding of the possible uses of GIS tools. For example, some sites preferred to use consistently formatted datasets, made available by official agencies alone, whereas others provided a great deal of detail around the low-level specifications of geospatial data types that they create and use, such as KMZ (Keyhole Markup Language Zipped) files, SQL (Structured Query Language) database types, and LIDAR (Light Detection and Ranging) formats. Several sites replied to the survey with details about the additional supporting tools and resources they use in their endeavours with GIS, including a multitude of web map servers and products, such as Google Earth,[132]Esri ArcGIS Story Maps[133] and PastMap.[134]

The survey asked site managers to comment on the reasons for not using GIS, if that was the case, or to indicate the barriers to using more GIS tools and techniques. Many mentioned the lack of human resources available to use GIS tools, or a lack of knowledge among those who were attempting to do so. An absence of consistent and centralized staff training was apparent, with some sites reaching out to local experts (privately or through academic links) to achieve the tasks that they wanted using GIS. This absence also extends to the lack of dedicated IT and supporting infrastructure for many sites, which prevents some from even beginning to think about utilizing geospatial data in a more comprehensive way.

Additionally, many site managers spoke of the complexity of acquiring, managing, and storing data, and navigating the legal restrictions around using much of the data that they were interested in. Some also referenced a lack of overall quality of the data that were available to them and were uncertain where they could obtain more or better-quality data. Visibility of data and overall GIS usage between sites appeared poor, especially when respondents mentioned their knowledge of the wider GIS data landscape. See Section 2 of the Supplementary Information document for the breakdown of results.

## 5. Periodic reporting

To investigate whether the survey results were supported by trends in global reporting outcomes, a study of UNESCO programmes' statutory reporting procedures for all three types of designation between 2016 and 2019 was conducted.

Between 2016 and 2019, the MAB International Coordinating Council identified 52 biosphere reserves as not meeting the criteria of the Statutory Framework of the WNBR during the periodic

"If there were to be major reductions in funding and consequently to human resources as a result of e.g. Covid-19 this could seriously impact the ability of the management partners to deliver agreed management plan activities designed to protect the OUV of the Site."

**World Heritage Site, UK**

"A new management plan has been written but without the needed financial and human resources, the work identified to protect, conserve and promote the WHS will be unachievable and the management plan will not be fully implemented."

**World Heritage Site, UK**

Distant fire in Pimachiowin Aki UNESCO World Heritage site, Canada / Hidehiro Otake

review process. The number of reasons for not meeting the criteria ranged from one to five per site. The most common reasons were issues relating to zonation (for example, lack of zonation rationale, including no zonation; lack of buffer zone or insufficient explanation; and lack of a zonation map), lack of community involvement, governance issues (such as lacking a management body for the site), and the lack of a management plan.

Between 2016 and 2019, 16 UNESCO global geoparks were given a yellow card, and two of those were subsequently given a red card. The number of reasons for being given a yellow or red card also ranged from one to five per site. The most common reasons for geoparks experiencing issues during revalidation included lack of site visibility, insufficient human resources, lack of community engagement, and a lack of networking and participation in the international network.

Between 2016 and 2019, 63 World Heritage Sites submitted a total of 139 state-of-conservation reports identifying a total of 588 sub-threats over the four years. The most commonly identified threats were management systems/management plans, housing, the legal framework, the impact of tourism, visitors and recreation, ground transport infrastructure, and major visitor accommodation.

During the second cycle of periodic reporting (2012 to 2015), the most commonly identified *specific threats* in North America were: climate change and extreme weather events; non-native invasive species and translocated species; development and energy or transportation corridors; illegal activities, specifically vandalism, in both natural and cultural properties; financial constraints; and water and air pollution.[135]

In Europe, the most commonly cited factors were: built environment (housing and/or transportation); tourism, visitor and recreational activities; and climate

change-related factors (such as humidity and natural hazards).[136] These were fairly similar for cultural, natural and mixed properties through the region.[137] Properties in the UK and Canada most frequently identified management and institutional factors and social and cultural uses of heritage as the *categories of threats* they were facing. See Section 3 of the Supplementary Information document for a summary of the analysis of periodic reporting.

## Discussion of findings

A potential limitation of the study was that the survey was administered in August 2020, during the COVID-19 pandemic, when lost revenues from tourism, recurring lockdowns and staff absences may have stretched human and financial resources and influenced the nature of the responses received. This timing may also have affected the response rate; just 45 per cent of designated site managers in the UK and Canada responded to the survey. However, the survey's findings were supported by the analysis of periodic reporting from 2016 to 2019 (in qualitative responses) and by the case studies. Therefore, we are confident that the survey findings are representative of designated sites in the UK and Canada.

Another potential limitation was that there was some scope for misinterpretation of the meanings of the 13 *categories of threat* and 82 *specific threats* used in the survey. However, the findings (which were based on the analysis of qualitative responses, case studies and periodic reporting) did not contradict the survey responses, lending further confidence to the findings.

The absence of geoparks from two of the four clusters is likely because the UNESCO Global Geopark designation is relatively recent compared to the other two designations. As a result, the impacts of housing and commercial development in clusters 3 and 4 may not have been felt yet.

Importantly, the survey results and case studies revealed valid reasons to group UNESCO site-based designations in the UK and Canada as sites for sustainable development: in addition to adopting participatory approaches to landscape and site management, the data demonstrate that different types of designated sites in both countries face similar sustainable development challenges. The cluster analysis provides a methodology for identifying sites that could potentially exchange knowledge on how to manage such challenges.

Saddle Island Shoreline Erosion Mitigation, Area C Rendering Oven. Red Bay Basque Whaling Station UNESCO World Heritage site, Canada / Cindy Gibbons/Parks Canada

Clearance of invasive non-native species, rhododendron, on Cribarth, Fforest Fawr UNESCO Global Geopark, Wales, UK / Brecon Beacons National Park Authority.

Taken together, the survey and cluster analysis represent an initial step in identifying opportunities for knowledge exchange across countries. For example, the survey identified the fact that flooding is one of the most significant threats for designated sites in the UK and Canada, but the exact nature of flooding challenges was elicited from the qualitative responses and case studies. The survey and analysis also serve as an important first step in a framework for knowledge mobilization.

The study also identified the limitations of the UNESCO designated sites' abilities to fulfill their roles as sites for sustainable development. As outlined previously, effective site management requires the existence of management plans; the involvement of partners, stakeholders and rights holders; and the availability of human and financial resources to carry them out. The survey results identified significant challenges in these areas, especially when it comes to resources. These findings were evident in the sections relating to background information (for example, volunteer and staff capacity), in the section about GIS capacity, and in the quantitative and qualitative responses to the list of threats.

Common threats identified in the survey, such as flooding, invasive species and the impacts of tourism, all have spatial aspects that require data for assessment and monitoring. The survey results indicated that some site managers and their partners are using geospatial data and some form of GIS to monitor and manage threats. Although geospatial data collection may be strongly motivated by the need to satisfy UNESCO minimum data requirements, none of the qualitative responses mentioned periodic reporting as a reason for collecting and analyzing these data. Where site management teams do have access to GIS, it is apparent that they desire not only to use them for internal purposes, but also to engage the wider community. Indeed, several survey participants mentioned the application of GIS for encouraging "citizen science" programmes.

The most widely held category of data was related to "natural and cultural heritage conservation," a broad category that could include various data resources related to heritage values and sites (such as sites of significance, key heritage attributes and/or features, bio-geographical data, archaeological data). It is not surprising, given the UNESCO designated sites' mandates, that the natural and cultural features of

places and landscapes are among the most important geospatial datasets for management.

When we consider the use of geospatial and other types of data, the ideal state would be for site managers to have all the data they need for effective site management. If we compare the threat analysis results with the datasets that sites already held, we can uncover conflicting priorities. Even though some *categories of threat* were ranked highly (such as "climate change and severe weather events" and "management and institutional actors"), many site managers do not hold datasets that would support a better understanding of these. In addition, other identified threats, such as "pollution" and "building and industry," are not wholly supported by the coverage of datasets such as "industry" or "settlements."

It is possible that there is a mismatch between the threat analysis and data available owing to a lack of understanding of what data are required. It may also be that sites have only recently identified the highest-ranked threats, so have not been collecting the appropriate data for long enough. Furthermore, site managers may need to work more closely with their stakeholders and partners to pool GIS data into a central resource or database. However, it is perhaps most likely that site managers collect the minimum data required to fulfill their UNESCO obligations. Where time and resources are constrained, they are likely to focus on these ahead of anything else.

In summary, sections 1, 2 and 3 of this report outlined the niche occupied by UNESCO designated sites with respect to applying nexus approaches to sustainable development, described the alignment of the sites' mandates and structures with Agenda 2030, and illustrated the participatory approaches to site management that places site managers in an ideal position to address the three core elements (economic development, social inclusion and environmental protection) and actions (global, local and people) required for sustainable development. The case studies presented in section 4 illustrated how site managers work with multiple stakeholders and rights holders to find solutions to commonly identified sustainable development challenges at the site level.

The next section provides recommendations for next steps.

Drone pilot and Observer in Pimachiowin Aki UNESCO World Heritage site, Canada / Hidehiro

# 5

# Sites for sustainable development: Recommendations for realizing their potential

## Highlights

To realize the full potential of UNESCO designated sites as sites for sustainable development, there is a need to:

- improve opportunities for knowledge exchange between UNESCO designated sites across borders by regularly monitoring the sustainable development challenges they face and making the results available in a searchable global database

- develop multi-designation thematic networks of UNESCO designated sites (including across designation types) to allow site managers and stakeholders to collaborate

- provide training for UNESCO designated site managers on the collection, analysis, management and sharing of data with their stakeholders

- build the human and financial resource capacities of UNESCO designated site management teams

Primary School visit to Cuilcagh Mountain Park / Cuilcagh Lakelands UNESCO Global Geopark, Northern Ireland, UK.

This final section makes recommendations based on the report findings and survey analysis on how UNESCO can realize the full potential of designated sites for sustainable development.

The first two recommendations are aimed at improving opportunities for resource mobilization and knowledge exchange between sites. This would accelerate progress toward Agenda 2030 and build on existing opportunities for knowledge exchange (outlined in section 3) by providing more deliberate and structured opportunities to share innovative approaches to sustainable development. The remaining recommendations are aimed at enhancing sites' capacities, individually and collectively, to be sites for sustainable development. These latter recommendations address both financial and human resource needs and training and expertise needs.

Brownies take part in a beach cleanup organised by Isle of Man UNESCO Biosphere Reserve, UK. The Beach Buddies project is working to expand its innovative approach to beach cleaning to other countries / Isle of Man Biosphere Reserve

### Recommendation 1: The UNESCO Secretariat, Member States and National Commissions should improve opportunities for knowledge exchange and resource mobilization among UNESCO designated sites in different countries by regularly monitoring the sustainable development challenges they face and making the results available in a searchable global database.

Revalidations and periodic reviews and reports are important tools for UNESCO and its Member States to monitor sites' progress toward their respective mandates, and in this regard are designed to monitor different types of values. Data from these monitoring processes are available in the State of Conservation Information System (World Heritage) and global database being developed by the MAB Programme.

However, the survey of common threats and the cluster analysis approach presented in this report provide potential methods of harmonizing the global monitoring of sustainable development challenges across all designated site types – without questioning the existing global monitoring of different types of UNESCO designated sites – and for improving collaboration and resource mobilization.

Future iterations of this study should examine whether the approach could also be applied to designated sites in countries beyond the UK and Canada to examine whether the trends can be applied more broadly across the global membership of UNESCO designated sites. If further investigation demonstrates that this approach is globally applicable, the inclusion of greater numbers of designated sites from around the world will produce a robust dataset for the cluster analysis. Since every site faces a unique range of threats – and each threat will affect the site in a different way – the aim here is to offer a methodology for identifying a basis for site managers to partner with each other.

For example, site managers facing similar challenges could partner, identify common stakeholders needed to address these challenges, and jointly bid for funding for projects that develop innovative threat mitigation strategies. These partnerships could bring together universities, schools and community groups to share knowledge and create shared objectives for combatting common challenges and threats. In this way, a global database would be a tool by which UNESCO designated sites could identify other sites that share similar challenges. It would then be up to those site managers to explore the nature of their shared challenges, identify opportunities for sharing best practices, and partner on shared projects. The data in such a database should be openly available so the wider community can access the expertise of UNESCO designated sites.

The application of the survey, the results of its analysis, and the maintenance of a global database should be performed under UNESCO's leadership. To avoid reporting fatigue, the UNESCO MAB and International Geoscience and Geoparks Programme secretariats could integrate the questionnaire into the biosphere reserve periodic review and geopark revalidation processes so that site managers could complete them when they are already gathering information about their site. Member States and National Commissions should encourage their site managers to participate in the monitoring process and encourage and support their efforts to develop partnerships.

## Recommendation 2: The UNESCO Secretariat, Member States and National Commissions should develop multi-designation thematic networks of UNESCO designated sites to allow site managers and stakeholders to collaborate.

This report shows that site managers collaborate not only within their own respective local and regional partnerships, but also to some extent with other sites nationally and internationally. Our analysis tells us that where sites perceive common threats and challenges with similar sites, there are opportunities for opening dialogues and sharing information, creating partnerships and bidding jointly for funding. The UK National Commission for UNESCO's partnership with Visit Scotland and 13 UNESCO designated sites (World Heritage Sites, biospheres, global geoparks and Creative Cities) in Scotland to address over-tourism and promote sustainable travel in and between sites is a good example of this approach.[138] Clearly, if sites were able to learn from the best practices, mistakes and case studies of others, there would be a notable benefit in helping them to manage and plan for the future.

As discussed in Section 3, there are existing national and international networks of UNESCO designated sites that mobilize knowledge, share best practices and develop partnerships. However, these regional and thematic networks currently contain members of only one type of UNESCO designated site – and, as demonstrated in this study, different types of designated sites in different countries share similar sustainable development challenges along with the five attributes that make them ideal for testing innovative sustainable development approaches. Therefore, there is a case to be made for developing multi-designation thematic networks whose membership comes from different types of designated sites.

Member States and their National Commissions (including site managers and their stakeholders) should encourage and support national opportunities for knowledge mobilization between different types of UNESCO designated sites. These opportunities could have multiple formats, including multi-designation meetings, conferences, mailing lists and databases of best practices. International opportunities for knowledge exchange across designation types should be performed under UNESCO's leadership. The database proposed in Recommendation 1 could be used to identify themes for multi-designation networks.

St Kilda UNESCO World Heritage site, part of Scotland's UNESCO Trail. The Trail, a partnership between the UK National Commission for UNESCO and Visit Scotland, brings together the country's six World Heritage Sites, two Biosphere Reserves, two Global Geoparks and three Creative Cities / corlaffra / Adobe Stock

Mining Scanner above Village Bay at St Kilda UNESCO World Heritage Site, UK / Historic Environment Scotland

## Recommendation 3: The UNESCO Secretariat, Member States, UNESCO designated site managers, universities and international data science organizations should provide training for UNESCO designated sites on data collection, analysis, management and sharing.

This study demonstrates that site managers face challenges obtaining, analyzing and managing data. Data, especially spatial data, are important for all aspects of site management, including monitoring and community engagement. Data are also important for designing and monitoring innovative approaches to sustainable development and for sharing these approaches beyond individual sites.

Many site managers who responded to the survey reported that a lack of training or specialist skills limits their capacity to work with geospatial and other data. Basic training in data literacy, GIS/geospatial data processing and GIS should be offered to staff at UNESCO designated sites. UNESCO could lead this training, working alongside colleagues at the UN Geospatial Information Section or in partnership with local networks and contacts at educational institutes, including UNESCO chairs and category II centres.

The survey also indicated that some site managers actively engage with, or source data from, national mapping agencies or other official or governmental providers. However, not all are aware of what data are available, and in many countries, such organizations may not even exist. Member States and UNESCO should support site managers to forge partnerships with other organizations and agencies – where appropriate and within their own borders or internationally – for data collection and management. Sites should also be encouraged to share their experiences through existing or new knowledge-exchange structures. If site managers can learn to co-operate more easily on issues around data collection and sourcing, they could also learn how to make use of the data. Moreover, structures such as shared wikis, content management systems and publications can enable them to collaborate with others on issues about the data. Every effort should be made to

ensure that such structures are inclusive, to consider technical capacity differences between Member States, and to adhere to the norms and principles of UNESCO's Recommendation on Open Science.[139]

Training on data collection and analysis will increase opportunities for UNESCO designated sites to share knowledge about innovative approaches to sustainable development locally, regionally and internationally. Supporting sites to collaborate comes with the challenge of ensuring that data can be shared widely, with the appropriate controls, understandings and agreements in place. To achieve any form of sharing at scale, a centralized, accessible data catalogue or information asset register could be a key component of a future data strategy for UNESCO sites around the world. UNESCO and its partners could assist by standardizing tools, negotiating licences where required, and supporting the technical elements for sites that require it. The development of an online GIS for World Heritage Sites in Europe and North America by the Government of Flanders[140] is an important step forward in this approach, but more needs to be done to ensure data-sharing between types of designated sites.

It is important to consider that some countries and cultures may not have the resources to produce data to match data catalogue standards. It is also important to look beyond a "western" view of managing data standards and compliance. Local and regional processes for producing "maps" and "data" for cartographic and GIS purposes may well be the very kind of knowledge – in some cases intangible cultural heritage – that sites want to document, given that the knowledge system may be under threat. Asking local communities to change the way that they do this deepens the threat instead of mitigating it. In contrast, an approach that invites local communities to "map" UNESCO designated sites or landscapes using their own methods will precipitate a rich diversity of approaches – tangible and intangible – that will allow Indigenous and local communities to define and express what is valuable to them about the designated sites and to foster strong partnerships for participatory site management. Therefore, Member States, UNESCO and other partners should ensure that training for UNESCO designated site managers and their stakeholders on data collection, analysis, management and sharing includes a diversity of knowledge systems.

Weather station in Uapishka mountains, Manicouagan-Uapishka Biosphere Reserve, Canada / Marianne Valcourt

### Recommendation 4: Member States and sub-national authorities, National Commissions, other UNESCO programmes, and UNESCO designated site managers should build the human and financial resource capacity of UNESCO designated sites.

UNESCO Member States that are parties to the World Heritage Convention and host biosphere reserves and UNESCO global geoparks should provide sufficient financial and other resources to UNESCO designated sites within their countries so they can fully execute their mandates and fulfill their roles as sites for sustainable development. This will help Member States, which are also State Parties to UN multilateral agreements, including Agenda 2030, to fulfill their statutory and legislative obligations to these international instruments.

Sites that are under-resourced financially (and also, therefore, in terms of human resources) are trapped in a vicious cycle of having to prove they can fulfill their roles as sites for sustainable development in order to justify to governments that they deserve funding. Many sites in the UK and Canada operate as not-for-profit organizations and receive project- or program-based funding that is often short term and does not allow the sites to invest much in staff or training to support their general operating capacity. However, experience from many countries shows that it can take five or 10 years to establish fully functional sustainable development models. Short-term project funding severely curtails sites' abilities to fulfill their mandates and execute participatory approaches to landscape management at the temporal and spatial scales required. Investments in the organizations that manage UNESCO designated sites have the potential to turn many of the challenges identified in the survey into concerted actions toward sustainable development at local, regional and national levels.

Member States and sub-national authorities can also facilitate national opportunities for improving the human resource capacity of UNESCO designated sites by including co-operation with sites in government mandates (including those of funding agencies) and in strategies for higher education institutions. UNESCO National Commissions and focal points can contribute by encouraging co-operation between their UNESCO designated sites and UNESCO chairs, UNESCO institutes and centres, and other UNESCO programmes within the Member State. Similarly, the UNESCO Secretariat can help build international human resource capacity by encouraging more co-operation between its designated sites and other programmes.

What is also clear is that UNESCO designated sites are participatory in their approach. While there is usually one site manager, co-ordinator or management team, this person operates and works with many stakeholders across a site or landscape to meet their objectives, including protecting their cultural and natural heritage. UNESCO should work with National Commissions, agencies (such as the International Union for Conservation of Nature and the International Council on Monuments and Sites), national governments and others to produce guidance, toolkits, methodologies and other means of working with multiple stakeholders to solve sustainable development challenges. UNESCO should also review the use of its branding, communications and other means to promote successful sustainable development approaches between different categories of sites.

## Conclusion

These four recommendations are not mutually exclusive. The importance of data cannot be overstated: it is essential to participatory site management and knowledge exchange, and is of critical value when it comes to sites' capacities to demonstrate their value to all stakeholders as sites for sustainable development.

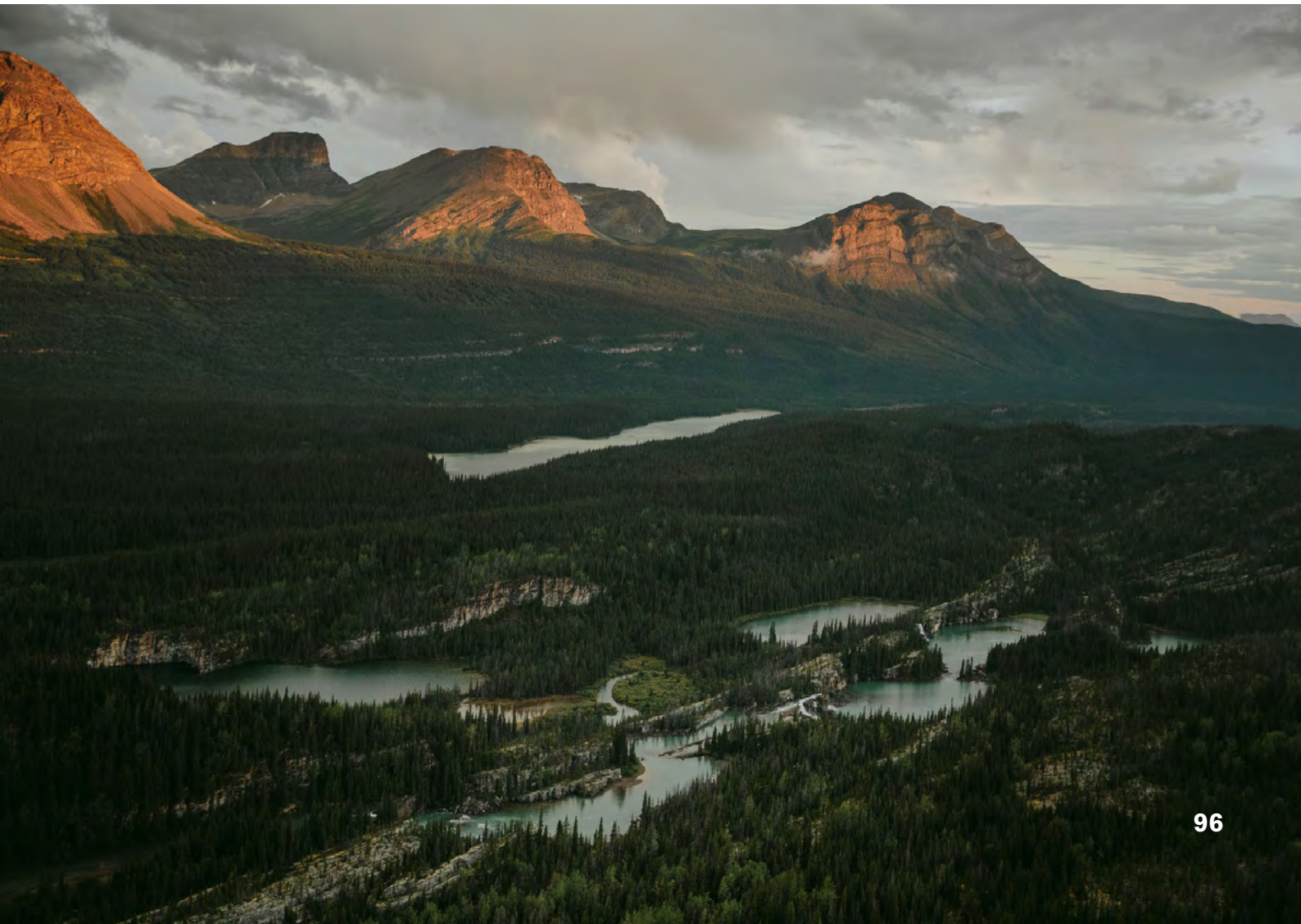
The findings of this report should be distributed as widely as possible to the managers of UNESCO designated sites, National Commissions, ministries responsible for UNESCO, and the UNESCO Secretariat. Site managers play an important role as honest brokers by convening stakeholders and rights holders with conflicting interests, identifying and closing knowledge gaps, drafting scenarios and visions, and facilitating the development of innovative local solutions to pressing global challenges.

They need to be enabled and empowered as key actors for advancing sustainable development by being made aware of the report.

In addition, policymakers at local, national and international levels need to be aware of these findings in order to support them appropriately. The UNESCO Secretariat has a key role to play by facilitating co-operation among the managers and stakeholders of the different types of designated sites and within the Secretariat.

UNESCO designated sites for sustainable development are at the cutting edge of Agenda 2030. To fully realize their tremendous potential, they require systems and infrastructure for knowledge exchange and training, human and financial resources, and data.

The first rays of sunlight hitting Castle Mountain in the Tumbler Ridge UNESCO Global Geopark, Canada. The Monkman Cascades are a series of ten spectacular waterfalls dropping over hard quartzite bands of rock in the Monkman Provincial Park. / Destination BC



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